WEB PROFESSIONALS:

HOW DO THEY EXPERIENCE INFORMATION LITERACY?

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Keywords

Information Literacy, Web Professionals, Website Design, Website Development, Phenomenography, Experience.

Abstract

In an era where information is power, the effective use of it, called “information literacy”, becomes a key consideration. This consideration and its associated aspects are being researched in different contexts and from different perspectives. Information literacy is now being advocated as a popular object of research in different settings, such as educational contexts, various workplaces or everyday life. It is also being investigated from the perspective of different groups of researchers adopting different theoretical perspectives, such as behavioural, socio-cultural and relational approaches. This qualitative research was designed to address the understanding of a group of professionals of the phenomenon of information literacy. Targeting web professionals as the population of the study, the research identified how this cohort experiences the phenomenon of information literacy in their everyday professional practice. Taking advantage of a phenomenographic approach, this understanding is presented through a map of variation, which includes four different ways in which web professionals experience the phenomenon under investigation. Analysis of 23 in-depth interviews with web workers from different stages of web design and development process revealed that they experience information literacy as staying informed, building a successful website, solving a problem or participating in a community of practice. The present research advances the existing understanding of the concept of information literacy, especially in an occupational context. Additionally, using the web professionals’ world as the context of the study, the research also contributes to the field of website design and development by shedding light on less-researched experiences of people involved in this industry. It is anticipated that the outcome of this doctoral research will be of use and value to the professional education of future practitioners in both areas of information literacy, and web design and development.

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Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: QUT Verified Signature

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Chapter 1: Introduction

1-1 Introduction

The web world is expanding every second. We live in an era where the electronic environment permeates every part of our lives. To contribute to this significant aspect of today's life, the research presented here was designed with an overview to investigate the professional experience of builders of this fast-paced, changing world – web professionals. They are the group of people who have the critical role of pushing forward the formation of the World Wide Web. However, in contrast to the world of the web, their own world has hardly been researched.

Among the many possible phenomena associated with their practice, the study of the phenomenon of the information literacy of web professionals was selected for this research. In a very basic sense, information literacy has been interpreted as applying information resources to solve a problem or do a task (Zurkowski, 1974). In a more detailed way, it is "the ability to identify, locate, evaluate, organise and effectively create, use and communicate information to address issues or problems at hand" (The Prague Declaration, 2003). From a different perspective, however, information literacy has been considered as the experience of effective use of information (Bruce, 1997). This latter is how information literacy is viewed in the present thesis. From this position, what is investigated in this doctoral research is the effective use of information among web professionals when building the web environment. It should be acknowledged here that in different parts of the thesis the terms "information literacy" and "effective use of information" are used interchangeably. However, the pattern is to use "information literacy" when considering the phenomenon in a more theoretical discussion and using "effective use of information" in the participants' practice-based context. For instance, since the research findings chapter concerns real life experiences of web professionals, the term "effective use of information" has been used in Chapter 4. Meanwhile in clarifying the theoretical position of this research among other information literacy research efforts in Chapter 2, the term "information literacy" has been used.

Although this research may appear to be an interdisciplinary study that relates two areas of website design and development and information literacy, it should be noted that the key focus is on researching information literacy. Therefore, in this thesis, discussion about information literacy dominates the atmosphere of the research, while website design and development only serves as the context of the study. This positioning is due to the nature of the phenomenon of information literacy. That is, for studying such an abstract phenomenon, a context is always needed. In the case of the study presented here, website design and development was selected for this purpose. This choice, as was mentioned above, mainly relates to the current lack of research in the territory of web professionals' practice.

Similar to the value of this research in filling a gap in the field of professional experience of web builders, the current study also significantly contributes to the field of information literacy. So far, for researching information literacy, three different contexts (educational, workplace and community) have been identified. The aim of studying the information literacy of web professionals bounds the scope of this research to that of a workplace information literacy study. The concept of information literacy in a workplace setting is still emerging and research into this field has been highly recommended (Lloyd & Williamson, 2008). This implies that our understanding of information literacy in different contexts and workplaces still needs further development. As a result, exploration of a unique workspace will make a valuable contribution to the existing body of knowledge of workplace information literacy and, more generally, information literacy as a broader concept.

This first chapter of the present thesis provides a background to the study of web professionals' information literacy. The current section delineates the context of the research very briefly. Next section mentions the starting point of the study. This is then followed by explaining the research problem that informs the research. The methodology applied in this study along with an overview of the results come next. A section then briefly indicates the significance of doing such research, which is followed by a discussion of the scope of the study. The chapter concludes with a glossary of the key terms and concepts used in this thesis, followed by an overview of the structure of the whole document.

1-2 Preliminary Inspiration

The nascent idea of this study appeared years ago when the researcher was acting as a web librarian at a prominent overseas university. As part of her role, she was involved in the design and development team of a new library website, which was being run on a content management system (CMS). As part of the design and development team, she had the opportunity to observe the practice of her web-design and development-team members. Coming from the library and information science territory, her observation was flavoured especially with an information use perspective.

During her collaboration with the team, the researcher could see that web professionals engaged in the project did not have a clear view of what information was available to them and how they could most effectively make use of it. This caused her to assume that the problems and issues with websites designed and developed on the web might have something to do with the lack of awareness of a transparent portrait of information and how to use it in an effective way among people responsible for building the web. Therefore, after arriving at the Queensland University of Technology (QUT) Information Studies Group, whose focus is on people's engagement with information, the researcher decided to frame her doctoral research scope by this area of web professionals' effective use of information or, more specifically, their information literacy. The investigation into the relationship between the ways information is used for building websites and the outcome of such practice is postponed for further research in the future.

1-3 Research Problem: Why Information Literacy of Web Professionals?

Information is power (Drucker, 1999). Referring to this, proper use of information is introduced as the secret of success of organisations (Goad, 2002). In this regard, the significant role of information literacy in the success of businesses is manifested. This has been clearly stated by either workplace information literacy researchers or the corporate world itself (Cheuk, 2008; Travis, 2011). Today many businesses are becoming information-driven and the number of business leaders who need information literate workers for knowledge management is increasing (DeSaulles, 2007).

As a specific group of practitioners, web professionals are no exception to this consideration. Similar to other work contexts, engagement with information is unavoidable in their day-to-day practice. With respect to their influence on the websites they produce (Faiola & Matei, 2006; Moss, Gunn, & Heller, 2006), their information engagement may also have impact on their practices and eventually on the websites they build. In this regard, being effective information users might result in websites that are more communicable as the product of their practice. Therefore, it could be surmised that the more effectively they use information, the better the product they produce. The importance of the quality of these products is especially noticeable when attention is focussed on the fast growth of web world and its influence on every aspect of people's lives.

Taken together, these highlight the importance of information literacy for this cohort. Despite this importance, there is a lack of website design and development-specific interpretation of information literacy. Without such understanding, making advances in promoting information literacy in the territory of website design and development is hampered. As a result, practitioners involved in this domain will not take full advantage of relevant understanding about effective use of information. Therefore, the lack of understanding of web professionals' information literacy is the research problem that the present study intends to address.

The necessity of conducting such research is advocated by workplace information literacy researchers. Lloyd and Williamson's (2008) emphasis on studying different contexts and workplaces for extracting contextualised images of information literacy is a good example. Further support is provided by evidence (to be discussed in Chapter 2) that indicates a general understanding of information literacy produced in educational settings is not usable and transferrable to workplace contexts. Moreover, researchers debate that this general understanding is not entirely based on users' experiences of information literacy, but has its roots in information literacy experts' experiences (Hepworth & Smith, 2008).

Having all this in mind, this study was designed to gain a better understanding of information literacy among web industry practitioners, from their own point of view. Such research therefore seeks an answer to the question below:

- How do web professionals experience information literacy?

The findings are assumed to shed light on the way information and effective use of it is experienced by this cohort. With respect to what was mentioned above, this is a) a contextualised understanding of information literacy, b) beyond the educational setting and c) based on users' experiences and not information literacy experts. With the findings, an agenda for educating web professionals could be developed in the future.

Endeavouring to delve into the experiences of web professionals about the phenomenon of information literacy, phenomenography was adopted as the most appropriate methodology of the study. Having a unique ability to explore variation in experiences, the findings of the study are in the form of a set of categories of description that are interconnected in an outcome space. Therefore, a more detailed form of the research question of the present research is:

- What are the different ways in which web professionals experience information literacy?

The next section gives an overview of phenomenography.

1-4 Methodology

In an effort to understand and describe a group of people's experiences of a particular phenomenon, the current research adopts phenomenography as its research methodology. Phenomenography is an interpretive research approach through which the researcher is enabled to describe a phenomenon in the world through the eyes of others (Marton & Booth, 1997). Two important points are notable from this statement:

Firstly, the current study is implemented from a relational approach and within an interpretive paradigm. Adopting a relational viewpoint, the current study accepts the position that meaning is constructed through an interaction (or relationship) between a subject and an object (Crotty, 1998). This means that there is always a "mind" needed to construct the "meaning" of an object (p. 8). Then, within the interpretive paradigm, it is accepted that the mentioned interaction is interpreted by the researcher for the formal report of the meaning. With regard to the current study, the reality of information literacy is presented as an interpretation expressed by individuals and reported by the researcher. This means that the present study holds

the perspective that the truth of information literacy is twofold: while it is constructed through an interaction (or relationship) between web professionals (subjects) and information (object), it is also interpreted by the researcher. This means that the construct of information literacy is not a truth independent of them (i.e. either web professionals or the researcher), "out there" and discoverable by them. In phenomenographic technical terms, this relationship is called "experience". Importantly, experience is the object of study and the unit of analysis in phenomenography. This is discussed in detail in Chapter 3.

Secondly, in this study, the phenomenon of information literacy is considered from the perspective of research participants and not the researcher. Having said this, it is acknowledged that this statement is not in contradiction to what was mentioned above about the researcher's interpretation. In technical words, instead of a first-order perspective, phenomenography adopts a second-order perspective in collecting data. It is actually a necessity in an interpretive paradigm, that reality requires analysing people's observations and interpretations rather than the researcher's (Livesey, 2006). That is, having a second-order perspective, the researcher only reflects on how research subjects construct their own meaning of the phenomenon in question. As a result, all findings in such research are based upon the experiences of research participants. It is the voice of web professionals being heard through this study, which is framed by the researcher in the form of categories of description and an outcome space.

The main goal of each phenomenographic study is to demonstrate variation in the ways people experience the phenomenon in question. Aligned with this goal, the categories of description are constructed to show this variation. Thus, the categories of description reflect the qualitatively different ways in which research participants experience the phenomenon under investigation. To identify these categories of description, the phenomenographic researcher engages an iterative process in a search for similar and different meanings in the gathered data. Groups of meanings, which are qualitatively different from each other, form the categories of description.

The categories of description indicate the qualitatively different ways individuals are aware of the enquired phenomenon. That is, each category is about individuals' unique awareness of the phenomenon. This awareness is presented through a structure, called a "structure of awareness" (Marton & Booth, 1997) and is

constituted of three zones: focus of awareness, background of awareness and margin of awareness. In each category, various elements associated with the unique meaning of that category sit in these zones. Additionally, across all categories there exist common aspects of the phenomenon that are experienced, with different values in each category. These are called dimensions of variation. Therefore, in addition to a unique meaning, categories of description are also different from each other in terms of their structure of awareness (i.e. how individuals are aware of the associated elements of that meaning) and their dimensions of variation.

In addition to the structure of awareness within categories, there may also exist relationships between categories. A manifestation of these relationships, along with categories of description and their structure of awareness and dimensions of variation, forms the outcome space of the phenomenon in question, which is the ultimate outcome of a phenomenographic study.

The research data for this study was gathered through 23 in-depth semi-structured interviews with people involved in the whole process of website design and development. The audio-recorded interviews were then transcribed and analysed through a mixed method of analysis, including manual and computer-aided analysis in Nvivo software. This practice resulted in four categories of description along with identified relationships between them. Taken together, they form the outcome space of the phenomenon of information literacy experienced by web professionals. The next section will give an overview of the identified categories of description. A full description is then presented in Chapter 4. As was mentioned earlier, for the specific level of analysis, the term effective use of information is used.

1-5 Overview of the Outcomes

The analysis of the interview transcripts revealed variation in experiencing effective use of information among web professionals. This variation is presented through four categories of description. In addition to the experienced meaning of effective use of information, each category describes the two dimensions of information and information use. A summary of each category is described below.

Category 1 – Effective use of information is experienced as staying informed.

In this category, web professionals see information as movements in their surrounding information environment or more precisely, as potentially useful pieces of this environment. In an act of using information, web professionals scan this environment and start to form a knowledge base for their future use. The use of information is then experienced as effective only if this constant monitoring of the information environment results in keeping them current with the changes and emerging trends within the environment (Sub-category A: Keeping current) or a knowledge base forms, which helps the web professional to deal successfully with occasionally occurring problematic situations (Sub-category B: Building a knowledge base).

Category 2 – Effective use of information is experienced as building a successful website.

In this category, web professionals see their effective use of information in delivering a successful website. However, a successful website could have different meanings, due to the existence of different stakeholders in the process of website design and development. A successful website for individuals in this category could be a website that the client is happy with (Sub-category A: Making the client happy), a website that the user is satisfied with (Sub-category B: Making users satisfied) or a website that works seamlessly (Sub-category C: Building a seamless website). These varying meanings of a successful website constitute the three sub-categories of the broader category 2. As a result, information also finds varying meanings in these three subcategories. In this regard, information is experienced respectively as client, user, or side effects and technical issues that web professionals encounter in their everyday jobs. Similarly, information use of individuals in the three sub-categories is described as an endeavour to develop an understanding of the clients' or users' needs, or an effort to build and maintain a website that works as seamlessly as possible.

Category 3 – Effective use of information is experienced as solving a problem.

In this category, web professionals see their use of information effective only if a problem they encounter is solved. This problem could have different forms ranging from a simple technical problem to a decision making situation. Accordingly, information for individuals in this category is seen as a solution, which could be as simple as a piece of technical information or as complex as an informed decision. Web professionals in this category also have a clear focus on information resources, so that they interchangeably use the terms information resources and information. Furthermore, they see use of information as an act of seeking and acquiring information with an aim of solving their problems.

Category 4 – Effective use of information is experienced as participating in a community of practice.

In this category, web professionals see effective use of information as being part of a learning community of practice. This is a community in which an information giving and taking culture is fostered. Such a culture is understood by them to lead to advancement in the industry. For individuals in this category, information is either their own knowledge that they are willing to share with others or the quality knowledge produced and shared by the rest of the community. The act of using such information is then a relationship between givers and takers, in which givers make their information available for the rest of the community and takers seek good quality information made available by individuals and specially industry leaders. However, as just mentioned, this use of information is seen as effective only if this give and take practice results in advancement in the field.

1-6 Significance of the Study

The significance of this study lies in the contextualised understanding it presents for the phenomenon of information literacy. Therefore, in addition to the field of information literacy, the outcome of the research is of interest and importance to the context in which this phenomenon is investigated: website design and development domain. The potential benefit is both in terms of theory and practice. Taking advantage of the phenomenography methodology, the reflections on

the research process may also be of significance to the methodology. These are discussed below in detail.

1-6-1 Information Literacy-Related Significance

The outcome of this research is of great interest and significance to a range of groups within the area of Library and Information Science (LIS). Firstly, this research provides information literacy researchers with a deeper understanding of the information literacy phenomenon, especially within the workplace setting. More specifically, exploring this concept through a phenomenographic lens provides the research territory with a new and alternative relational model of information literacy. By making a contribution to previous relational models and representations of information literacy (e.g. Boon, Johnston, & Webber, 2007; Bruce, 1997; Webber, Boon, & Johnston, 2005), this new model can add to the larger relational portrait of information literacy. From a higher-level perspective, the relational approach complements the other theoretical approaches towards information literacy, to offer a more holistic conceptualisation of information literacy.

Secondly, the current research is of importance to LIS educational practitioners. While the present phenomenographic research occurs outside of the educational context, the potential application of the resulting outcome in educational settings connects the study to this context. Educators in LIS benefit from the new contextualised image of information literacy stemming from this research, for educating LIS students. This new understanding also gives useful insights for consideration when redesigning an information literacy curriculum.

Finally, the outcome of this research is important for its potential in promoting the portrait of the information profession beyond the library context. Being aware of the outcome of this research, information professionals who work with people within the web industry will be enabled to offer services that are more effective and relevant. Moreover, members of website design teams (for instance, information architects), can take advantage of the results of the current research in order to play their roles as effectively as possible.

1-6-2 Website Design and Development-Related Significance

The implementation of this study has also benefits for website design and development field. First of all, this research sheds light on web professionals' world of practice. So far, a noticeable amount of research about website design and development, and users has been conducted. In comparison to this robust body of research, few studies have been focused on web professionals as the key people in shaping the web world. Therefore, this research is of significance in terms of studying a rarely-researched world of practice. However, due to a focus on only one particular aspect of their world (i.e. information literacy), this understanding mainly includes insights into how they engage with information in effective ways. Besides, the study will also be of significance to web professionals in terms of the advantages it will have for the design and development of tools and software that are being applied by them. A clearer understanding of web professionals' view of information and their effective use of it provides web tool designers and developers with valuable insights into how their products can facilitate this engagement in more effective ways.

1-6-3 Phenomenographic Research Significance

Taking advantage of a phenomenographic approach, this study also contributes to this research methodology. Unique observations occurring in each phenomenographic study can contribute to the current state of knowledge of this methodology and be of significance for further consideration in future phenomenographic studies.

1-7 Scope of the Study

As mentioned above, this research will contribute to an understanding of one aspect of web professionals' world: their information literacy. As this research is a departure point in this area, it does not limit the research population in terms of their position in the process of website design and development, as well as the type of websites they constructed. Therefore, research participants were sought from different stages of a website design and development project, and regardless of what type of websites they built. There was also no limitation in terms of the geographical location of participants. That is, as long as a participant was considered suitable for the purpose of data collection, regardless of their location, they were invited to an

interview. This decision was mainly based on the virtual nature of the web industry, which renders the individual's location irrelevant.

The current research also contributes to the available understanding of information literacy. However, among the different contexts for researching information literacy, this study mainly adds to the knowledge of information literacy within a specific workplace (or an occupation). The findings nevertheless will be applicable in educational settings.

1-8 Key Terms and Concepts

Since this research is an interdisciplinary study, it has two completely different backgrounds and probably a range of different audiences. Furthermore, the current study takes advantage of a qualitative research methodology that has its own technical terms. These terms might be unfamiliar for some of the audience of this thesis. Therefore, it is useful to present a preliminary description of key terms and concepts being applied in the thesis at this point.

Web design and development: As will be demonstrated in detail in Chapter 2, website design and development in this research is considered as the whole process of planning, designing, and building a website. This process ranges from user research to concrete design and maintenance.

Web professionals: The people who this research is concerned with are web professionals, who are those engaged throughout the whole process of website design and development, regardless of the exact phase in which they practice, such as design, information architecture, user research, development, programming, usability testing, analysis, and marketing. Such a broad meaning of web professionals is used in this thesis to resolve an ambiguity in communication, especially with website design and development communities, where specific titles are used for people involved in different stages of constructing a website.

Information literacy: According to the predominant approach to information literacy, this concept is defined as "the ability to identify, locate, evaluate, organise and effectively create, use and communicate information to address issues and problems at hand" (The Prague Declaration, 2003). In this research, however, the relational approach is adopted towards information literacy, that views it as being able to use information effectively in different ways (Bruce, 1997). Furthermore,

according to Lupton (2008), to be able to study information literacy as a construct, a concrete task is required. The concrete task through which web professionals' experiences of information literacy is explored in this thesis, is building websites.

Effective use of information: The term "effective use of information" reflects Bruce's (1997) definition of information literacy. Effective use of information is considered as a more concrete equivalent of the abstract concept of "information literacy" and therefore, is applied as the "working definition" of information literacy in this study, mainly in discussing research results. This was also in order to enable participants to understand the abstract term of "information literacy". Effective use of information was also used by O'Farrill (2008, 2010) in his research on information literacy and knowledge management at work.

Phenomenography: Phenomenography is a research approach through which the researcher will be able to present a description of the distinctly different ways in which people experience the world around them (Marton, 2000). Through this research approach, a pattern of variation in experiences of people about a phenomenon is revealed.

Experience: An experience is "a relationship between an object and a subject, encompassing both" (Marton, 2000, p. 105). Experience is the unit of analysis in a phenomenographic study.

Categories of description: Among the many different ways of experiencing a particular object, there are some limited ways of experiencing that object that are qualitatively different from each other. These will be categorised to form the categories of description. In the present study, four categories of description are identified.

Outcome space: Categories of description constructed for a phenomenon are logically interrelated. The categories of description together with the logical relationship between them is called the outcome space. The outcome space is the synonym for "phenomenon" (Marton, 2000, p. 105) and is the ultimate result of a phenomenographic study.

Referential and Structural aspects: In phenomenography, each category of description is discussed in terms of the meaning participants assign to the phenomenon. This is referred to as the referential aspect of each category, which

talks about “what” participants experience about the phenomenon in that category. The categories of description are also discussed in terms of the relationships between aspects of the phenomenon in each category of description and across them. This is referred as the structural aspect, which talks about “how” participants are aware of the phenomenon in each category and as a whole.

Dimension of Variation: Each phenomenon is experienced in terms of a set of common aspects that may receive different values in different categories of description. These are called dimensions of variation. The identified dimensions of variation in this study are “information” (as what the participants found informing) and “information use” (as the of act using information, regardless of the outcome of such an act). These are two aspects of the phenomenon of information literacy that present in all four categories of description in this study, but with different characteristics.

Conclusion

In an information age, it is vital for everyone to be able to use information in an effective way. This applies to every aspect of people’s lives including personal, professional, and educational aspects. Web professionals, the critical people in forming the world of online information, are not an exception. With respect to their rarely-researched world, an exploration into their understanding of information literacy in their occupation is of doubled significance. Such exploration sheds light on this cohort’s view of information and how they engage with it. Implementation of this research is also of importance and value to the field of information literacy, which requires a more articulated knowledge of the concept of information literacy beyond the educational context. Taking advantage of a phenomenographic approach, the resultant understanding is in the form of patterns of variation in the collective experience of the phenomenon of information literacy shared among web professionals. It is expected that the findings reported here will support curriculum development for both web professionals’ and information professionals’ education in the future. This practice allows website design and development students to expand their understanding of information and ways of using it effectively. Additionally, it can be of benefit of LIS students to obtain an additional tangible view of the concept of information literacy.

1-9 Structure of the Document

In this chapter, an overview of the study was provided. Chapter 2 presents a review of the literature, incorporating the two separate fields of website design and development, and information literacy. Chapter 3 introduces the methodology applied in the presented research. This involves a presentation of the paradigm that frames the research, along with the rationale for using phenomenography as the methodology of the research. This is followed by an overview of phenomenographic principles and the research design. Chapter 3 is finalised with a detailed discussion of justification of the trustworthiness of the study. In Chapter 4 the findings of the research are discussed. This includes a full presentation of the four categories of description and the outcome space that demonstrates the relationships between the four categories. Chapter 5, as the last chapter of this thesis, provides an overview of the research and elucidates the contribution of this study to the existing body of knowledge. The last sections of Chapter 5 and this thesis mention the limitations of the study, as well as further investigation departure points stemming from the current study.

Chapter 2: Literature Review

2-1 Introduction

In this chapter, existing research of relevance to the present study is investigated. Due to the interdisciplinary nature of the current study, the literature for each discipline (i.e. website design and development, and information literacy) is presented in two parts. The first part provides an overview of the website design and development research. Through this, the scarcity of research into web professionals practice is highlighted. This section sets the research context in which the current study is implemented. The second part explores the existing literature in the field of information literacy, as the object of this study. The content of this latter part distinguishes the current understanding of information literacy in three contexts (educational, workplace and community) and sets it apart from three alternative perspectives (behavioural, relational and socio-cultural). This approach is taken to establish the borders of the current study, in terms of its perspective towards information literacy. A conclusion section forms the third part of this chapter, that frames the gap, which is addressed by the current study.

Part 1 – Website Design and Development

The following section explores the literature within the field of website design and development. The general argument that forms this section demonstrates why web professionals were selected for the purpose of this research and on which area of broad website design and development industry this research is focused.

2-2 Why I am Doing this Research about Web Professionals

It has been two decades since the World Wide Web was first born, in 1993. Since that time, development of the Web has continually proliferated and users have become increasingly dependent on online communication. The number of indexed web pages by Google was around 47 billion in October 2011, in comparison to 14 billion in October 2009 and 23 billion in October 2010 (DeKunder, 2011). In the same year, the internet users population surpassed 1.83 billion (Computer Industry Almanac Inc., 2010). It was more than ten years ago when Isakowitz, Bieber and

Vitali (1998) pointed out that the marketing aspect of the Web had been replaced by its position in supporting all dimensions of organisational works. Similarly, Kent, Taylor and White (2003) introduced websites as public relation tools for all types of organisations. Along with its increasing importance, the necessity of understanding all unknown aspects of this new world and its associated problems, such as information overload, poorly designed websites or weak user performance, made it a specific area of research that required continuing research activity for addressing increasing issues.

From the early years of the Web, the area of website design and development (i.e. building websites) received a significant amount of attention in terms of researching websites themselves and their users. Countless research efforts, which investigated the process of design, development and evaluation of different types of websites in different contexts along with their associated aspects, form the major part of the literature in this area. Vast studies on users of websites are also added to this body of literature.

The research efforts that focus on website design and development have generally explored procedures, strategies, and frameworks for the purpose of designing and developing different types of websites. In this regard, part of the existing literature (mainly in the form of books) is focused on the design and development process of general type of websites, in addition to works that concentrate on designing and developing a website in a specific context or from a particular perspective. There are a number of examples of different contexts of interest for exploring website design and development. Othman, Hussin and Rakhmadi's (2008) study in developing a practical guideline to build a trusted e-commerce website is one example of a study situated in a business/commerce context. An example study situated in the public sector includes Lee's (2003) proposal and testing of a framework for managing website development in the public sector. Perris, Graham and Scarsbrook (2006) investigate design and development of a radiology administrational and educational website. Similar to this health-related context are research reports on building an interactive proteomic website (Hui, Wei, Kwan, & Raja, 2008), websites for patients with type 2 diabetes (Yu et al., 2012) or breast cancer survivors (Pauwels, Hoof, Charlier, Lechner, & Bourdeaudhuij, 2012).

While some research works explore the whole process of design and/or development, others investigate one particular aspect of it. For instance, based on examining 190 websites, Tarafdar and Zhang (2007) introduced two determinants of website performance: reach and loyalty.

As was mentioned above, along with the progress of design and production of websites, the issue of their evaluation also receives research attention. In this regard, two major areas are usability and accessibility of websites. Usability, an old concept being used for measuring the ease of use and learnability of artefacts, was soon applied within the new web context. This resulted in the creation of five main dimensions of quality measurement for websites which are learnability, efficiency, memorability, errors, and satisfaction (Nielsen, 1994). Usability rapidly became one of the most popular and well-known methods of evaluation used by researchers and practitioners in different contexts. So far, numerous studies have explored this concept, for example the usability evaluation of museum websites (Cunliffe, Kritou, & Tudhope, 2001), language learning websites (Son & Park, 2012), company websites (Cappel & Huang, 2007), e-commerce websites for developing countries (Hasan, Morris, & Probets, 2013), a library website (Ebenezer, 2003), Chinese destination management organisations (Qia, Law, & Buhalisb, 2008), a hotel website (Molich & Dumas, 2008), a distance education website (Isman & Isbulan, 2010), an e-government website (Isa, Suhami, Safie, & Semsudin, 2011); a society website (Phillips & Dietz, 2012), and a college website (Snider & Martin, 2012). Some also resulted in emerging methods, guidelines, and instructions, such as Torrente, Prieto, GutiéRrez and Sagastegui's (2013) generation of a framework for measuring usability, based on the type of website.

The other key area for evaluating websites is accessibility. According to W3C (2012), accessibility is about people with disabilities being able to "perceive, understand, navigate, and interact with … and contribute to the Web". Therefore, an evaluation from an accessibility perspective is mainly concerned with measuring how easy it is for disabled people, and even old users or low-literates, to use a website. Parallel to usability, accessibility receives notable attention in terms of research (Hackett & Parmanto, 2005; Hong, Katerattanakul, Choi, Kang, & Cho, 2008; Latif & Masrek, 2010; Mitsamarn, Gestubtim, & Junnatas, 2007; Sligar & Zeng, 2008; Zeng & Parmanto, 2003).

Similar to the research in website design and development mentioned previously, studies in the evaluation area are context-specific. This is due to variance in the nature of websites across contexts, which has not enabled experts and practitioners to always agree upon general evaluation standards and techniques. A few examples of context-specific evaluative works are Flavian, Gurrea, and Orús's (2009, p.168) "Decalogue of guidelines"; Korgaonkar, O'Leary and Silverblatt's (2009) success factors for e-commerce websites; Burch's (2001) investigation into educational website principles; Lynch, Schwerha and Johnson's (2013) weighted heuristic for older adults websites; Morrison, Taylor and Douglas's (2004) evaluation approaches for tourism and hospitality websites; and Elling, Lentz and de Jong's (2007) standard website evaluation questionnaire for municipal and governmental websites. Similar to the last one is the investigation by Doush, Bany-Mohammad, Ali and Al-Betar (2013) into the accessibility of governmental websites. In line with this research trend, Tsai and Chai (2005) generate a nursing website evaluation questionnaire. Also in this context, Choi and Bakken (2010) implement heuristic evaluation and usability testing in a health-related website. Zahed, Van Pelt, and Song (2001) carry out an investigation into the design of international websites, to present their findings about implications of website design for users from different cultures. However, interestingly, these guidelines generate other types of problems in terms of their application by website designers and developers (Kim, 2010; Tao, 2008), which is highly relevant to the gap this study intended to address. This is discussed in depth in the following sections.

In evaluating websites, the importance of understanding users and involving them in the design process is emphasised (Atterer, Wnuk, & Schmidt, 2006; Mao, Vredenburg, Smith, & Carey, 2005). Although most of the evaluative research involves users in the studies, a group of them have an explicit focus on users and their needs. This group of studies includes a considerable share in the website design and development research field. A few examples are Bull, Phibbs, Watson and McFarlane's (2007) study in considering needs of young adults in the area of STD/HIV and pregnancy prevention; Lo and Wang's (2012) effort in studying users' cognitive styles; Sterling, Nyhof-Young, Blanchette and Breakey's (2012) investigation into internet needs and use of haemophilia adolescents; McCarthy et. al's (2012) research work in involving young people in the design and development

of a sexual health website; Lynch, Schwerha and Johnson's (2013) study that considers characteristics of older adults for developing a weighted heuristic; Schneider, van Osch and de Vries's (2012) Delphi study through which users (as well as experts) are involved in the development of health-related websites; Tan and Wei's (2006) investigation into users' cognitive process during web browsing; and Clayman, Boberg, & Makoul's (2008) enquiry into the perspective of 30 patients and 22 healthcare providers for developing an educational website.

The research works mentioned so far were all about either websites or users of the websites. However, given the production line of a website (Figure 1), there exists another factor that has a critical role in the design and development process: web professionals. Web professionals are the ones who link the users and websites together by creating websites and making them accessible for users. With such a mediatory role, their strong influence on website design and development is obvious. This influence is mentioned in some studies, though implicitly. For instance, Faiola and Matei (2006) pointed to the cognitive style of designers which affects successful website user performance. Aligned with them, a few others highlighted the role and influence of "website designers" (Kim, 2010; Kotamraju, 2002; Moss, et al., 2006; Sgobbi, 2002; Tao, 2008; Walker, 2002) as one of the three main components of the website design production line.

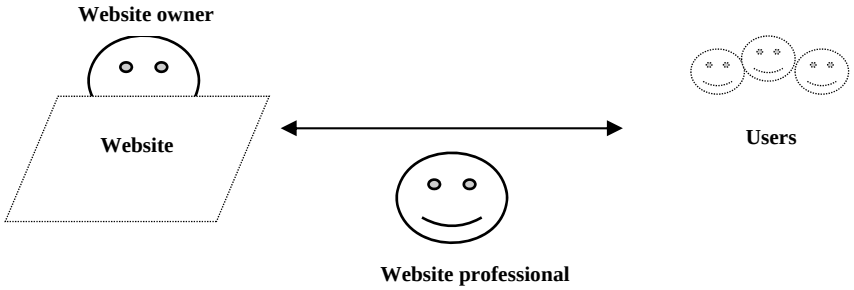

Figure 2-1 The position of the web professional, between users and the website

As was suggested at the beginning of this section, to date the principal foci of research related to the website production line have been websites and users. Although the need to study web professionals has been highlighted by some authors, (Palmer, 2002; Tan & Wei, 2006), this group has received little attention in terms of empirical research. Therefore, given the influence of their perspective on website design and development, it merits exploring their world of practice. This exploration

can be approached from different aspects. For the purpose of this study, their experience of information literacy is chosen. This decision is based on evidence already existing in the relevant literature in the information literacy territory, which will be discussed shortly. However, before that is an examination of what website design and development means, who are being referred to as web professionals in this research and the few existing studies of web professionals.

2-3 What does Website Design and Development mean? Who are Web Professionals?

Website design and development is referred to as the general area of practice that includes building websites for the internet. In an overall view, the term "web design" encompasses the whole process of constructing the website. However, experts and practitioners in the industry of web design suggest there are two specific areas of practice: website design and website development. Among web professionals, the term "web design" refers to the actual design process of a website. This includes the design of the look and feel of a website, which is a representation of the website's owner (i.e. the associated business). The web design sometimes even covers the translation of the look of the website into HTML and CSS. Web professionals then relate the term "web development" to the functionality and technical aspect of a website. This specifically covers areas such as scripting and database work (Plumley, 2010). More specifically, the web design process involves an iterative progression from less detailed to more detailed representations of the site, including artefacts such as site maps, storyboards, page schematics and mock-ups (Klemmer, Newman, Farrell, Bilezikjian, & Landay, 2001; Lin, Newman, Hong, & Landay, 2000), while web development covers programming the functionality of a site (Eccher, 2010).

This distinction has its roots in the early stages of the broad industry of web design. As will be mentioned later in section 2-4, web design first emerged as a consensus, mainly between people from a technical side and people from an artistic side. The technical side involved IT professionals, particularly programmers, whereas the artistic side involved graphic designers. The former defined web design in terms of coding and situated it in the IT domain, while graphic designers looked for opportunities to be involved in terms of information design, interaction design and navigation design, to separate themselves from the technical aspects of web

design (Kotamraju, 2002). This can be seen in studies like that conducted by Taylor, McWilliam, Forsyth and Wade (2002, p. 390), involving case studies in 25 UK organisations. This study shows that website development is the "preserve of IT specialists". Eccher (2010), on the other hand, believes that a versatile web designer needs to embrace a good knowledge of both technical and aesthetic aspects of web design, although notably this is not "a must". Holzschlag (2003, p. 16) views designers who possess both skill sets as having "hybrid personalities". As a further effort to show the connection between the two, she highlights the role of a project manager. She recommends the integration of web design and web development specialists in the form of two separate teams and under the management of a project manager, in order to connect the programming and design worlds to each other.

Similar to formalised opinion, there exist informal views on the distinction between the two areas, which is stated by the community of practice. As will be seen in the research findings chapter, the community of practice within the industry of website design and development is very influential in terms of forming knowledge within the field. Therefore, the view of community members is also considered here. For instance, Edwin Lynch (2013), a web development educator, uses the analogy of a car body painter for a web designer as opposed to a car mechanic or a mechanical or electrical engineer for a web developer. With a different analogy, The Web Showroom (Lynch, 2013), a web design firm, uses the metaphor of interior designers and construction workers to compare web designers and developers respectively. Dream.In.Code ("Web designer vs. web developer," 2013), one of the leading online communities of programmers and developers, specifies the expertise of two groups. They define developers as experts who know different languages and style sheets versus designers who use graphic software to create and bring to life the layout of the website. In line with them, Dumitru (2011) from the Graphic Design Blog describes web designers as being "more concerned with aesthetics and user experience than functions". From his point of view, web designers are experts in making the site "easy to use and fit for purpose". Dumitru (2011) then refers to developers as people covering "registration, content management systems, e-commerce, and database applications" work in building websites. He suggests it is this second group that makes the website functional. Scott Dillon (2011), a freelance web designer, suggests a modification to the basic principle of website design and

development, arguing that the principle should be “Function over Form” rather than “Function through Form”. He sees both parts in a marriage and that “one can’t go without the other”.

Having specified the distinction between aspects of website building work, researching the website design and development domain is categorised in three ways: 1) research in web design; 2) research in web development; and 3) research in both website design and development as a whole in which areas of art and code are fused together. However, there are many cases in the literature where either the term web design or web development have been used separately to refer to the whole process. An example is Lynch and Horton’s (2008) study, which uses the term “development” to refer to the whole process. For them, design is one of the six phases included in the whole process of development. The current research considers the whole process of building a website, and consequently fits within category 3, as it focuses on the overall process of design and development. With this in mind, this section will focus on exploring existing research related to the whole process of website design and development.

It should be acknowledged here that the current research started to use the two terms of “web design” and “web designers” to refer to the whole process and people involved in it respectively and for ease of communication. However, because of ambiguity when communicating about the scope of the study, especially among website design and development communities, the researcher decided to change this approach by taking advantage of the two terms of “website design and development” and “web professionals”, which were broader terms. It is believed that the usage of the latter set of terms assists different audiences to gain a clear view of the research population.

Like many complex concepts, website design and development has been defined in various ways by researchers. A major number of these definitions are common in considering design and development as a process. This process generally starts with planning, advances to designing and implementing, and continues to regular evaluation. In a very condensed view, Farkas and Farkas (2002, p. 25) see three steps in the web design process, which are planning, design and building. They define web development as “the entire process of creating a website – from early planning through to final launch”. Seeing the process as a roadmap, Reimer (2011)

defines the web development process as “a documented outline of the steps needed to be taken from start to finish in order to complete a typical Web design project”. In his view, this repetitive process includes modifying and completing the same tasks over and over again in every web project. His sample process includes the five steps of planning, design, development, launch, and post-launch, which may differ from client to client or product to product. Based on Cato’s (2001, p. 3) definition of design, web design is the “process of creating a website (an “artefact” in Cato’s (2001) words) with a structure which is planned, artistic, coherent, purposeful and useful”. However, not all processes elucidated by different researchers and practitioners have unique steps. Instead, different perspectives enforce variation in describing the process. Table 2-1 shows a comparative view of some existing processes.

As is observed by Farkas and Farkas (2002), and seen in Table 2-1, the website design and development process is “complex and variable” (p.25) and does not normally allow for prescribing a pre-defined set of tasks. Moreover, different stages are so closely interwoven that they cannot be wholly separated from each other during the process. However, Table 2-1 also shows that although every one of the four studies considered the process with different levels of detail or steps, they all have the same major steps. That is, they all roughly start with designing of the construct and end with the development of that construct.

Table 2-1 The website design and development process, from the perspective of different researchers

<table>
<tr><th>Garrett (2003)</th><th>Taylor, et al., (2002)</th><th>(Lynch & Horton, 2008, p.24)</th><th>(Farkas & Farkas, 2002, p.26)</th></tr>
<tr><td rowspan="3">User Research</td><td rowspan="8"></td><td>Site Definition and Planning</td><td>Planning</td></tr>
<tr><td>Content strategy and inventory</td><td>Formulating purpose</td></tr>
<tr><td>Personas and audience research</td><td>Analysing and adapting to audience</td></tr>
<tr><td rowspan="4">Site Strategy</td><td>Analysis and research on similar sites</td><td>Review other websites</td></tr>
<tr><td>Business goals and budget resources</td><td>Choosing a business model</td></tr>
<tr><td rowspan="2">Process analysis and use cases</td><td>Establishing working relationships with the appropriate people</td></tr>
<tr><td>Determining and dealing with project constraints</td></tr>
<tr><td>Content Strategy</td><td rowspan="3">Website design (navigational/structural design)</td><td>Information Architecture</td><td rowspan="3">Establishing a theme and style + concept sketches</td></tr>
<tr><td>Information architecture</td></tr>
<tr><td>Project Management</td><td>User experience design</td></tr>
<tr><td>Abstract Design</td><td></td><td>Wireframes and page engineering</td><td>Planning content and content acquisition</td></tr>
</table>

Garrett (2003)	Taylor, et al., (2002)	(Lynch & Horton, 2008, p.24)	(Farkas & Farkas, 2002, p.26)
		Project scope and schedule	Planning for ample evaluation and performing early evaluations
Technology Strategy		Web technology planning	Planning report (project documentation and reporting)
		Site Design	**Design**
Content Production		Editorial and content development	Advancing the content list
			Working out the structure
		Graphic design and template	Creating design sketches and sample pages
			Designing for change and future development
Technology Development	Programming using website development tools	Web development	Building a prototype
			Design report (project documentation and reporting)
		Site Construction	**Building**
Concrete Design	Website testing	Site assembly and application testing	Setting up the work environment
			Developing, revising, reviewing content
			Coding special features
			Quality Assurance testing
			Completion report (project documentation and reporting)
		Site Marketing	
	Linking of web pages to back end and databases and legacy systems	**Tracking, Evaluation, Maintenance**	Post-release evaluation
	Compliance with relevant legislation and regulation	Site testing and final editing	

Depending on project size, varying numbers of specialists might collaborate within a team to accomplish a website design and development project. This means that in smaller projects, one person may act in several roles. Table 2-2 demonstrates a detailed view of responsibilities involved in a typical project.

Table 2-2 Roles in the website design and development process

(Farkas & Farkas, 2002)	(Lynch & Horton, 2008)
Producer	Project Stakeholder or Sponsor
Marketer	Web Project Manager
	Account Executive (Web Project Manager)
Information designer (information architecture)	Information Architect
Core content creator: writers, artists, photographers, animators, videographers, audio specialist	Art Director
	Web Graphic Designer (Art Director)
	Interactive Designer (Flash, JavaScript, Ajax) (Art Director)
	Media Specialist (photography, illustration, audiovisual, Flash) (Art Director)
Graphic designer	
Editor	Site Editor
	Site Copywriter (Site Editor)

(Farkas & Farkas, 2002)	(Lynch & Horton, 2008)
	Content Domain Expert (content coordination, research) (Site Editor)
Interface designer	Usability lead
Information retrieval specialist	
Usability specialist	
Instructional designer	
Quality assurance specialist	Quality Assurance Tester (Web Project Manager)
HTML coder, programmer, documentation specialist, technical support technician	Web Technology Lead
	Web application programmer (.Net, Java, PHP/Perl, Ruby) (Web Technology Lead)
	Web page engineer (XHTML, CSS, JavaScript, Ajax) (Web Technology Lead)
	Database Administrator (Web Technology Lead)
	Web system expert or webmaster (Web Technology Lead)
	Site Production Lead
	HTML page coder (Site Production Lead)

As touched on previously, web professionals play an important role in the way messages are delivered to users on websites. It was also mentioned that they have not received much attention in terms of empirical research. The next section now elucidates in detail the existing research gap concerning web professionals.

2-4 Research Background – Web Professionals

The phrase “web design” first came into vogue in 1997 as a result of the information technology evolution. In spite of holding many concepts in common with the “design” discipline, it began to develop as a separate domain with its own related practices and issues (Lin, et al., 2000). Accordingly, there appeared a need for a professional approach to developing websites (Holzschlag, 2003). Subsequently, demand for workers to implement the theoretical and technical process of creating websites arose at that time. This resulted in the formation of a relevant set of skills. Employers began to frame job descriptions for this new position. At the same time, professionals working in the area of information technology such as “programmers, systems administrators, and SGML document conversion operators ...” started to define themselves as skilled workers for the new position (Holzschlag, 2003, p.4; Kotamraju, 2002). Other specialists from the non-technical side, however, joined the IT group to propel the web design profession towards more varied practitioners. These included “artists; media specialists in TV, radio and advertising; business people; writers and general enthusiasts” (Holzschlag, 2003, p.4).

As previously noted, in contrast to other topics within the field of website design and development, practitioners (i.e. website designers and developers) have received less attention in terms of research. In his research, Vora (1998) stresses that the majority of surveys have generated a profile of website users, as opposed to the scarcity of research focused on website designers. In line with him, Rode, Rosson and Perez-Quinones (2005) emphasise conducting more research to analyse web developers' needs and gain more understanding about them. This is critical with respect to studies that highlight the influence of this group of professionals on the websites they build. Examples are investigations done by Faiola and Matei (2006) and Moss, Gunn and Heller (2006). In their study, Faiola and Matei (2006) explore Chinese and American web designers from a cultural cognitive perspective, which is a novel approach in comparison to previous behavioural studies. Their results reveal that variation in the cultural cognitive styles of web designers is reflected in the way they design websites. They also demonstrate that this in turn might result in better user performance, meaning users perform better when working with sites produced by designers from their own culture. In line with what was mentioned earlier, Faiola and Matei's (2006) findings suggest that the difficulties experienced by users might not only be related to users' lack of technical competence or usability issues, but also issues related to designers. In this case, for instance, they suggest that a designer's different cultural background may also impact on users' performance. Moss, Gunn and Heller's (2006) perspective in viewing web designers, however, is quite different. Instead of focussing on web designers from different cultures, they focus on different genders, male and female web designers, from an interactionist approach to web aesthetics. Web aesthetics takes advantage of mirroring principles. Their study indicates significant differences between websites developed by male and female web designers. The criteria they considered for their study included differences in navigation systems, the language used in the websites, and visual elements including thematic and non-thematic content. Among 23 examined features from these three criteria in website design, 13 items are observed to be significantly different.

A review existing literature, however, demonstrates that most of the exploration into practitioners has been implemented with the ultimate goal of using the findings to design, develop, and improve their tools. For instance, using a survey,

Vora (1998) profiles typical web designers, their toolkit, the environment they are involved in, and the process they go through to build a website. Klemmer et al. (2001) and Lin et al. (2000) take advantage of web designers' viewpoints to develop tools to assist them in their design practice. With a similar approach, Newman, Lin, Hong and Landay (2003) observe designers' practice in order to develop an informal web design tool. The approach of researching web developers and designers to generate more powerful and effective web development tools continues to be followed in a series of research projects conducted by Rosson and her colleagues. The group of Rosson, Ballin and Nash (2004) investigate "everyday developers" or "informal web developers" (Rosson, Ballin, & Rode, 2005), who are a group of development practitioners with no specific software development, programming or computer science training or education. Through educating this group of developers, they aim to gain an understanding of them. In another investigation, nonprogrammers' mental models are sources of data for Rode, Rosson and Perez-Quinones (2004), to be used as a basis for the design and development of web development tools. Rode et al. (2005) investigate the top challenges experienced by semi-professional web developers to identify their needs in terms of development tools. Their survey specifies ensuring security, cross-browser compatibility (also mentioned by Vora (1998)), integrating different technologies, debugging, and developers' inappropriate habits as the top challenges.

Kotamraju (2002) and Sgobbi (2002) are more focused on the skill set required by web developers and designers, who were introduced as the "new media workers" at the time of this research (Kotamraju, 2002p. 1). To identify the skill set, Kotamraju (2002) uses classified job advertisements, trade publications, informant interviews and fieldwork. Sgobbi (2002) takes advantage of an online questionnaire. After a six year study, Goles, Hawk and Kaiser (2008) confirmed that information technology workforce skills were still of great importance in the business environment. Interestingly, Goles, Hawk, and Kaiser (2008) and Sgobbi (2002) suggest that organisational skills (e.g. relationship management, project planning, information management, and team work) are more important than technical skills (e.g. programming and system analysis), for IT professionals in general and Web designers in particular. In her study, Kotamraju (2002) concludes that a set of skills for website design and development:

1. Emerged as a flexible set of competencies without technically defined boundaries. What constituted the set of skills for a web designer was not clearly defined from the very beginning of web design emergence. Therefore, new technologies and competencies could easily enter this set of skills, form them and change them over time;
2. Formed through a consensus between those concerned with code (IT professionals) and art (print-based graphic designers). The programmers and developers took the responsibility for the coding and functionality whereas artistic designers dealt with the structure and content;
3. Drew on the technology and online resources, rather than formalised education as the source of learning. These online sources included key websites as a sample, theories of web design in the form of guidelines and instructions, emailing lists, online forums and expert advice from social networks. New media workers shared and upgraded their knowledge through these channels using a "do-it-yourself approach" to learning;
4. Demanded continual skills maintenance and upgrading. To be considered a skilful, proficient and competent worker in the current time, web professionals need to continually reformat their competencies to be able to meet increasing advancing technology requirements.

For the purpose of continual skill maintenance, web workers constantly need information. This need for information supports the aims of this research. In this need for information, web workers seek information and then use it. However, their effective use of information is an unresearched area that is being covered by this research project.

In a unique study, Ahmed and van der Hoven (2010) investigated freelance web developers from the perspective of moral, role, legal, causal, meta-task and social responsibilities in the field. They suggested that although this group of developers may not be categorised as professionals, they are still responsible for their action.

Among studies on web professionals, a few studies have contributed from an educational point of view. Walker (2002) emphasises drawing on theoretical foundations when teaching web design students. She believes that directing students

to create their websites using existing theories would enable them to learn the genres of Internet communication and perceive the logic of practices of effective web design. Fan, Ye and Zhang (2011) share their experiences of teaching a course in web design practice methods, with the aim of improving the effectiveness of the program and enabling students to meet the needs of the market. Their shared experiences cover the areas of teaching objectives, teaching content, teaching methods and assessment. Lennon (2012), who is an educator of enterprise web systems, presents a prototype web developer-specific pedagogy, which is simplified methodology for e-learning support of web developers. Skov and Stage (2012) also base their investigation on educating a group of software development and design students in conducting usability evaluations. The idea of their study is to see if it is possible to reduce the gap between development and usability evaluation. Their study, however, is not specifically focused on *web* developers and designers.

The other area of enquiry into web professionals is their use of information. This area is the precise context of the current research. However, while the present research considers information in its broadest sense, the two other existing studies in this area only focus on guidelines as information for web professionals and they only consider web designers in their research. Studies by Kim (2010) and Tao (2008) suggest that designers find it challenging to follow existing guidelines. They both demonstrate that the critical issue for designers was selecting and applying the most appropriate guideline. While Tao (2008) relates this issue to the designers' knowledge and application gap concerning guidelines, Kim (2010) links it to usability problems with guidelines which prevent web designers from accessing and retrieving them effectively. Both studies address the reasons for ignoring formalised standards and guidelines by web designers, which are highlighted in earlier studies such as Taylor et al.'s (2002) series of case studies in 25 UK organisations. Kim (2010) and Tao (2008) demonstrate that only a few web designers in their studies take advantage of formal web design standards, frameworks and guidelines. Following Taylor et al. (2002), Tao (2008) assesses the knowledge-practice gap theory in information systems professionals when using web design guidelines to build websites. He concludes that his research participants are equipped with a satisfactory level of knowledge of web design guidelines. However, their application level is assessed as weak. This indicates the significant gap between knowledge and

application, reinforcing the importance of improving the application level. Following this, Tao's (2008) research suggests the implication for a solution that enables web designers to use the available knowledge. With this respect, Kim's (2010) work can be considered an extension of Tao's (2008) research. With the purpose of enhancing the application level of guidelines, Kim (2010) strives to develop an effective guideline for design practice, which is applied in a web design project. In his observational study, Kim (2010, p. 670) considers guidelines as the source of knowledge or an "intermediary interface" that connects the designer and the user interface knowledge together.

In his research, Kim (2010) considers guidelines mostly in the form of books and reports. Similarly, Tao (2008, p. 957) introduces guidelines as sources of information, which could range from an "individual advice" to "web design problem and solution strategies". However, there are other forms of knowledge (or information), rather than guidelines, that designers might consider in their work. For example, Walker (2002) stresses the importance of a knowledge of social context (an organised awareness of the user population) in creating websites. Similarly, Henneman (1999), and Lynch and Horton (2008) highlight paying attention to end users and their environment in the entire process of design, rather than "adherence to guidelines" (Henneman, 1999, p. 139). From the other end of the spectrum, Tanner (2008), and Lowe and Eklund (2002) stress involving stakeholder and customer needs into the design process. Taylor et al. (2002, p. 390) suggest, from studying 25 websites of UK organisations, that using formalised approaches such as "formal frameworks/standards/best practice guides" may be replaced by "ad hoc approaches". While web analytics such as hit rate and log-analysis based on visitors' activity is introduced as a major source of information by Manuel, Dearnley and Walton (2010), their usage is criticised by Law, Qi and Buhalis (2009) for ascertaining the usefulness of websites. They instead suggest developing and using sector-specific standards as reliable information sources.

From Tao (2008) and Kim (2010), it could be concluded that organising and structuring guidelines could lead to improved communication between designers and the existing knowledge of design, which in turn would enhance the knowledge application level between them. However, from a broader perspective, the current research suggests that one other knowledge-related solution, to improve the

application level of knowledge, could be implementing an investigation into web professionals' understanding of information as well as their engagement with information. In other words, although different types of information have been noticed in previous studies, the present research believes that having a holistic overview of web professionals' experiences of information and effective use of it (i.e. information literacy), and assisting them to become aware of that perspective, would support web professionals in improving their knowledge application level (the issue stated by Tao (2008) and Kim (2010)). Therefore, this study posits its focus on revealing an understanding of web professionals' experiences of information literacy. It is believed that conducting such a study will be beneficial for the education of web professionals.

2-5 Summary

Research in the web industry has considered three major separate components: websites, users and website builders. While the two former ones have received considerable attention in terms of empirical research, the latter requires more investigation from different aspects. In order to select a specific aspect for the purpose of this research, the issue of the low level of knowledge application among web workers is noted. With an aim to gain an initial holistic perspective of web professionals' information engagement, what they constitute as information and how they use information in effective ways, the current study sheds light on a particular aspect of web professional practice: information literacy. This aspect constitutes the key focus of this research. The second part of this chapter therefore explores existing knowledge of information literacy. In addition to demonstrating the information literacy borders of the current study, the next part also elaborates why web professionals were selected as the current research's participant cohort.

Part 2 – Information Literacy

Chapter 2 hereafter explores the literature in the field of information literacy. It reviews the concept of information literacy within three different contexts and from three different theoretical perspectives. Through this approach, a context-approach table at the end of the section positions the gap that the current research is filling.

2-6 Introduction – Information Literacy

The term “information literacy” emerged more than 35 years ago in a report by Paul Zurkowski for the US National Commission on Libraries and Information Science. At that time, this term described an information literate person as being able to utilize “the wide range of information tools as well as primary sources in molding information solutions to their problems" (1974, p. 6). About 20 years later, a panel of experts reached a consensus about the concept of information literacy through a Delphi study (Doyle, 1992). They defined an information literate person, basically as one who is able to access, evaluate and use information from a variety of sources. Another meeting of experts in 2003 expanded the existing definitions and in a document known as the Prague Declaration stated (The Prague Declaration, 2003):

> Information Literacy encompasses knowledge of one’s information concerns and needs, and the ability to identify, locate, evaluate, organize and effectively create, use and communicate information to address issues or problems at hand; it is a prerequisite for participating effectively in the Information Society, and is part of the basic human right of lifelong learning.

In that document, the “creation of information society” in which the citizens are information literate, was emphasised as a “key to social, cultural and economic development” of individuals and communities (p.1). In addition, it mentioned equity among people and countries which concludes closing the digital divide which would be achievable as a result of becoming information literate, aligned with having proper information accessibility, and effective use of information and communication technology. Not surprisingly, the emphasis of the experts participating in this meeting was on encouraging governments to promote information literacy nationwide. This emphasis was reinforced in another gathering of information literacy advocates in The Alexandria Proclamation (IFLA, 2005),

where information literacy was announced as a means of supporting social inclusion in the digital world.

Across all these years, many individuals and organisations continually endeavoured to define and describe the notion of information literacy. Firstly manifested in educational settings, researchers then started to explore information engagement of people in two other contexts (i.e. workplace and communities). Moreover, the early view of information literacy, which saw it as a set of isolated abilities and attitudes by individual users, started to be supported by more mature understandings. In this respect, new approaches for viewing the concept (Bruce, 1997; Lloyd-Zandiotis, 2005) resulted in more thorough perspectives. As a result, today a single description of the concept of information literacy does not exist and it seems that research in the area is leading to the emergence of variations in the existing descriptions. The researcher believes that this variation in view is not negative, but an opportunity that should be taken to construct a fully articulated portrayal of information literacy. Following this trend, and aligned with other research in this area, the current study aims to contribute to the emerging picture of information literacy. However, this occurs in a specific context – information literacy, as it is experienced by web professionals and practitioners. It is anticipated that the outcome will be useful in educating and promoting information literacy among web professional and practitioner communities.

Following the existing predominant contexts and perspectives for studying information literacy, the present research was conducted in a workplace context and viewed information literacy from a relational perspective. This positioning will be elaborated on below to set the scene for clarifying the gap that this research addresses.

2-7 Information Literacy in Three Contexts: Educational, Workplace, Community

The first movements for researching information literacy started within the educational sector, shortly after it was introduced in 1974 (Bruce, 2000). This has continued up to the current date. However, within a short time after introducing the notion of information literacy, the ALA Presidential Committee on Information Literacy's final report in 1989 (1989) pointed to the importance of engaging two

other contexts of workplace and community. This led information literacy research to grow beyond the educational environment. Nevertheless, this trend has occurred at a slow speed, with investigation into information literacy still predominating in the educational sector (Bruce, 2000; Edwards, Bruce, & McAllister, 2004; Harding, 2008; Hughes, Middleton, Edwards, Bruce, & McAllister, 2005; O'Farrill, 2008).

In a recent literature review, Lloyd and Williamson (2008) explored information literacy research in these three contexts. They also provided evidence that in spite of some research efforts in the workplace and community-related information literacy, the knowledge can be considered as "emerging" and being in its "infancy" in two latter contexts, respectively (p. 5, 7). Cheuk's (2008) and Mutch's (2008) findings further advocate this judgement, particularly from a practical viewpoint. According to them, not only the term "information literacy" is an unfamiliar phrase in the workplace, but also it is not understood broadly and in a clear way. Thus, terms such as "information management", "knowledge management", "data mining" or "computer literacy" are often used to convey the concept of information literacy in the workplace (Birdsong & Freitas, 2012; O'Sullivan, 2002).

The strong connection of information literacy to the educational setting is also observable where O'Sullivan (2002, p. 7) stated:

> If you enter the term "information literacy" into a search engine or article database, and exclude libraries or education from the results, you will end up with very little content.

Although this is an statement made over 10 years ago, the ratio of information literacy investigation within the education setting compared with the other two contexts is similar today.

In this way, the essential nature of research into the two contexts of workplace and community is underlined. Since web professionals are another area of interest in this study, the workplace context is chosen for the purpose of the current research. The importance of maintaining a research focus on workplace information literacy has been mentioned by information literacy researchers. The next section discusses this in depth.

2-8 Why a Focus on "Workplace Information Literacy"?

During the past few years, the impact of information literacy on successful workplace performance has been acknowledged by the corporate world (Travis, 2011). As a result, along with increasing importance of information literacy research, the interest for viewing this notion within workplaces has grown. Workplace information literacy received its first major attention between 1995 and 1999, during the "exploratory" phase of information literacy research, by Bruce (2000). Before that time, Eaton and Bawden (1991) had pointed out the importance of workplace information literacy by indicating information as an organisational resource and asset. Bruce (2000) specified information literacy as a "significant part of the character of learning organisations as well as a key characteristic of the organisation's employees" (1999, p.33). Bruce also emphasised the importance of the ability of dealing with large quantities of information of different quality and forms, for decision making, problem solving and researching (Bruce, 2008). She questioned the equal importance of information literacy in comparison with information technology and computer literacy, in Goad's (Goad, 2002) words, "information literacy's shadow".

Through the years from the first time workplace information literacy was researched, it has remained an interesting and more importantly essential topic of research. In 2002, O'Sullivan commented on the positive relevance of information literacy in the workplace, in response to questioning whether it is a considerable concept in such a context. The growing consensus on the necessity of considerations around workplace information literacy (Goad, 2002; Perrault, 2007; Weiner, 2011; Zhang, Majid, & Foo, 2010) reinforces O'Sullivan's (2002) argument. Macoustra (2004), who implemented a research into the information literacy of the newly trained information professionals and trainee lawyers, suggested (p. 134):

> Those who have introduced IL [information literacy] into the workplace have a more efficient and cost-effective organisation… Those organisations which have started to use the IL concept will already be reaping the benefits financially and culturally.

Cheuk (2008) focused on the importance of workplace information literacy by highlighting the strategic issue of providing employees with "access to the right

information at the right time" (p. 137). She has also emphasised the economic necessity of information literacy and its importance as "one of the top five essential competencies for solid job performance" (Cheuk, 2002, p.1). Similarly, Kirton, Barham, and Brady (2008) investigated the information literacy of government librarians which resulted in the recognition of the specific support that is required for the workplace information literacy.

Bearing these points in mind, a very important stimulus for launching research into workplace information literacy might have corresponded to the impropriety of transferring the understood concept of information literacy from one context to a different environment. The original domain in which information literacy was being manipulated was the educational domain. Given the mentioned importance of information literacy in the workplace, many (e.g. Mutch (2008), O'Sullivan (2002), Cheuk (2002, 2008) and Lloyd (2005)) started to wonder if understandings of information literacy gained from an educational context were usable in the workplace environment. They were curious to find if the concept delivered in the library and education sectors would enable individuals to successfully engage in information practices in their workplaces. Most of them found the answer to this question was negative.

Mutch (2008) outlined some reasons for this. He argued that information literacy is a topic of interest to those engaged in higher education. This would logically result in fruitful knowledge of this concept in the educational context but not in the workplace. To make the situation worse, library and information science professionals acting in different organizations were not being given information pivotal roles in their workspaces, to put the theory into practice. Obviously, without having decisive roles about information practices in their workplaces, they were rarely given a suitable opportunity for promoting information literacy in those environments. This might push information literacy into the background in the workplace. With a similar view to Leavitt (2011), Mutch (2008) relates the second reason of information literacy not being transferable between the two contexts, to the significantly different nature of information literacy within the educational domain as opposed to workplace. The significant variation in the nature of the concept might make it impossible for practitioners to transfer known aspects of it from one territory into another one.

Additionally, Sundin, Limberg and Lundh (2008), and Smith and Oliver (2005) have pointed out to the necessity of the different content of information literacy education, for students from different disciplines and academic maturities. This impropriety can be generalised to a larger scale where information literacy understood in an educational setting is supposed to be used in specific workplaces. D'Angelo (2012) emphasises information literacy as "situated and context-oriented" (p.648), indicating the impact of this view on the successful transition of students from the academic world to the workplace. Birdsong and Freitas (2012) agreed, stating that the information literacy designed for workplace purposes has to be in line with the information needs in that context. This is specifically important, as existing knowledge about information literacy disregards the different natures and characteristics of vocational settings. The complex, context-specific and open-ended tasks within workplaces make information literacy differently experienced in that context (Weiner, 2011).

To address the issues highlighted above, Mutch (2008) stressed the importance of modifying the approach to information literacy for the workplace. Interestingly, Hepworth and Smith (2008) arrived at the same conclusion. They examined if LIS and higher education information literacy conceptions developed by IL professionals were applicable in the workplace. Through a qualitative study, they identified users' information literacy needs rather than librarians' and experts' understandings of those needs. Similarly, they observed the mentioned gap between the two groups. They demonstrated that unfamiliarity with the term "information literacy" in the workplace and the "hierarchical and collaborative nature of the work" (p. 227) lead to more complex experiences of information literacy among workers, that could account for the gap between an expert-based view of information literacy within the educational world, on the one hand, and the actual information literacy experienced in the work world, on the other hand. Cheuk (2000) argued that in comparison with the experts' perspectives of information literacy, users' perspectives are of greater importance. In her view, this particularly should be considered in the workplace setting. For clarifying the users' points of view, she took advantage of a sense-making approach. In comparing two sets of perspectives, Head, Van Hoeck, Eschler and Fullerton (2013) took a slightly different approach – instead of comparing information literacy experts' perspectives to what is actually understood in the

workplace, they compared the information-related needs required by employers and what was perceived by graduates. As a result, they demonstrated the information work strategies valued by employers and the gaps in graduates' skills in applying the identified strategies. Such understanding was viewed as a tool that assisted in transiting from one context to another.

Following the movements mentioned above, there was observed a need for exploring the meaning of workplace information literacy. Consequently, there emerged efforts to reconceptualise information literacy in the new atmosphere of workplaces in compare these to what had been experienced and understood in the educational context. Research conducted by Bruce (1997) and Lloyd (2005) are two influential examples of this stream. Bruce (1997) identified seven different ways of experiencing information literacy in the workplace. However, her findings are mostly a reconceptualisation of information literacy in general, rather than developing a conceptualised framework of a specific context. Instead, Lloyd's (2005; Lloyd, 2007) study examined information literacy in the workplace and reconceptualised it with regard to this context. She suggested that information is experienced in different ways depending on the context. Along with "text" as the "theoretical source of knowledge" (Lloyd & Williamson, 2008, p. 6), she identified "social" and "physical" information experience as two other important role-players in workplace information practice. Therefore, she defined information literacy as "a complex socio-cultural and corporeal process that is constituted through a range of information modalities" (Lloyd, 2007, abstract). These different views of information literacy will be discussed later in this section.

A certain resolution of the unsuitability of applying educational-based information literacy in the workplace setting is what Lloyd and Williamson (2008) highlighted as one of the implications of their literature review. They suggested a need for exploring IL experience in different workplaces. Referring to the unsuitability of existing educationally-driven information literacy standards for being transformed to the workplace environment, they stressed on implementing research for understanding manifested information literacy in the workplace. They believed this would shed light on the preparation of new employees for entering their workplaces, in order for them to effectively use the available information. However, the differing natures and characteristics of various workplaces make it necessary to

research those workplaces in individual research efforts. This is demonstrated by O'Farrill (2010) as well where he recommended developing situation-specific information literacy guidelines rather than single encompassing frameworks. He related this to the fact of unique features of different workplaces and their various information literacy demands. He concluded that aims, field of practice, industry, organisational culture and etc. are all elements that cause the varied portrait of information literacy in different workplaces. Having all these in mind, conducting research in different workplaces is a solution for articulating the yet vague general concept of workplace information literacy that will lead to a clearer contextualised definition of this concept. This is the purpose of the current study. The particular context for studying information literacy in this research, as has already been mentioned, is the practice area of creators and builders of websites: the website design and development industry.

In addition to different contexts, information literacy has also been viewed from different perspectives. The next section elucidates different approaches to information literacy research, in order to specify the position of this study.

2-9 Information Literacy from Three Approaches: Behavioural, Relational, Sociocultural

Everyone carrying out research in the field of information literacy might agree unanimously that there does not exist a clear and single definition for this concept. The cause of this might be that researchers attempt to define the concept from different perspectives. So far, three predominant approaches for defining information literacy have been adopted: the behavioural, relational and socio-cultural approaches.

From a behavioural approach perspective, information literacy is about a set of generalizable competencies, skills, or behaviours. In this skills-based paradigm, information literacy is defined as "an understanding and set of abilities enabling individuals to recognise when information is needed and have the capacity to locate, evaluate, and use effectively the needed information" (Bundy, 2004). From the same perspective, Johnston and Webber (2004) defined information literacy as "the adoption of appropriate information behaviour to identify, through whatever channel or medium, information well fitted to information needs, leading to wise and ethical use of information in society" (p. 13). The Generic window of the GeST windows

produced by Lupton and Bruce (Bruce, 2008) also provides a description within a behavioural approach. It sees information literacy as "the cognitive skills and processes that individuals use for finding and managing information" (p. 110). CILIP's (Charted Institute of Library and Information Professionals) (2013) and Garner's (2005) definitions of information literacy also imply the same features.

The relational approach, first modelled by Bruce (1997) delineates information literacy quite differently. From a relational perspective, information literacy is about using information effectively in different ways, in terms of complexity. A more developed version of this description views information literacy as using information to learn (Bruce, 2008). Within this new description, "the different ways of engaging with information to learn" are studied as the concept of information literacy (Flegg, Mallet & Lupton, 2012, P.570). The relational approach to information literacy is the adopted perspective for the current study. Therefore, further discussion about it will come in a separate section in this chapter.

A third approach to information literacy was the socio-cultural perspective, which was taken by Lloyd (2007) and was further explored by other researchers (e.g. Sundin, et al., 2008; Tuominen, Savolainen, & Talja, 2005; Walker, 2012). Through the socio-cultural perspective, information literacy is "a core and critical information practice" (Lloyd, 2010, p. 245) or "a complex and holistic socio-cultural practice, which requires a person to experience information in a range of different ways in order to know the setting and its practices" (Lloyd & Williamson, 2008, p. 6). As a result, the individual becomes enabled "to communicate appropriately within a specific practice" (Limberg, Sundin, & Talja, 2012, p.104). In more simple words, from a socio-cultural perspective, information literacy is "a complex collective practice that is negotiated between people who are co-located and participating in the performances of a setting" (Lloyd, 2012, p.773). Within this view, information literacy is about becoming informed about a specific practice within its context and through the personal experiences of learners (Lloyd, 2009). Lloyd (2010) criticised defining information literacy as a materialized and decontextualized set of information skills, which in her view is a simplified and abridged form of this complex practice. Within the socio-cultural paradigm of information literacy, information is other than pre-formed material, stored in and accessible from a particular place. Rather, in many situations, people would be considered as the key

source of information. Emerging within a workplace context, socio-cultural perspective views information existing in "a web of social relationships" (Mutch, 2008, p. 21). As a result, social networking skills play an important role in becoming information literate (Hepworth & Smith, 2008).

The present research adopts a relational approach to study information literacy. This is mainly due to the intention of the study, which is uncovering the different ways of (i.e. variation in) experiencing the phenomenon under investigation. The relational approach is discussed below.

2-10 Relational Approach

The relational approach to investigating phenomena in the world around us is usually implemented through phenomenographic studies. These types of studies aim to identify variation in experiencing a phenomenon, which then enables the researcher to develop a collective portrait of that phenomenon.

So far, the relational approach has been used to view many different phenomena. Within the current research, this theoretical perspective is adopted to explore the variation in experiencing the particular phenomenon of information literacy within the specific context of website design. Therefore, in order to provide background on the relationally-viewed works in these two areas (i.e. workplace context and information literacy), the following two sections will review the workplace-related concepts as well as information literacy and research work viewed through a relational theoretical lens.

2-10-1 Relational Approach to Workplace Phenomena

Although the relational approach has mostly explored concepts within the field of education (Ebenezer & Erickson, 1996; Edwards, 2006; Harding, 2011; Irvin, 2006; Irvine, 2005; Lupton, 2008; Sjöström & Dahlgren, 2002; Trigwell, 2006; Trigwell & Prosser, 2009); there have been other fields such as the workplace that have taken advantage of this approach. Competence (Huntly, 2003; Sandberg, 2000), managing diversity (O'Leary, 2010), small firm internationalism (Lamb, Sandberg, & Liesch, 2011), and school based youth health nursing (Sendall, 2009) are some examples.

Using an interpretative approach, Sandberg (2000) demonstrated a new understanding of competence, as a critical problem for managers, at work which viewed it as the meanings that they constitute when they experience working. Focusing on conceptions rather than attributes, he introduced new points of departure for describing and developing competence at work. Similarly, Huntly (2003) investigated the phenomenon of competence to reveal the ways in which beginning teachers conceive competence during the early phase of their career. Her workplace, however, was located in an educational context which was the original context for phenomenographic studies. Aligned with Sandberg (2000) by presenting an alternative approach instead of an attribute-based approach towards a workplace concept, O'Leary (2010) investigated the different ways of perceiving managing diversity at work. Like other phenomenographic studies, the aim of her research was to highlight the role of people's experiences of a concept, which in her case was managing diversity. In the broader context of international business, Lamb et al. (2011) explored the shared understanding of owner-managers of small firms to reveal varying activities and practices of internationalisation processes. In their study, they developed an experienced-based theory of small firm internationalism that extended associated theories in the field.

The next section reviews the research in which the concept of information literacy and other close concepts are viewed relationally. This turns the focus of this section again to the current research topic.

2-10-2 Relational Approach to Information Literacy

As stated above, a relational model of a phenomenon is usually generated through conducting phenomenographic studies. In these types of investigations, the relationship of research participants and the object in study constitute the phenomenon of the study. The first research effort that adopted a relational perspective towards the phenomenon of information literacy was carried out by Christine Bruce (1997). In an educational workplace, she studied the phenomenon of information literacy, which turned out to be the relationship between information as the object of the study and a group of information users as the subjects of the study. Bruce's (1997) phenomenographic study resulted in developing a relational model called "The Seven Faces of Information Literacy". This model represented the

different ways in which information literacy is experienced as well as the structure through which those ways are connected. She explained that being aware of different ways users effectively use information could influence teaching methods and content in a positive way. Having her area of study focused on the workplace of higher educators, she suggested that awareness of different ways of experiencing information literacy in the workplace, in comparison to the educational environment, would probably affect professional education and development programs (Bruce, 1999).

Being aware of the relational model developed by Bruce (1997), other research projects were launched to explore information literacy in other environments. McMahon and Bruce (2002) explored variation in the information literacy of local staff in cross-cultural development projects. In his doctoral study, O'Farrill (2008, 2010) investigated the notion of information literacy, emphasising a workplace setting where he researched the viewpoint of staff in a tele-health organisation. Similar to the current study, he applied "effective information use" as the working definition of information literacy which resulted in eight different ways of understanding information literacy among research participants. Within an educational workplace setting, different information literacy conceptions experienced by secondary teachers were also revealed (Williams & Wavell, 2007). Information use, one of the key components of information literacy, was explored by Kirk (2002, 2004). Studying the relationship between people and information, she identified different ways in which senior managers experienced information use. Focussing on a similar phenomenon (i.e. information use), however within an educational setting, Maybee (2006) explored information literacy experienced by undergraduate learners. Similarly, Lupton (2008) conducted her relational information literacy research in an educational context. In her study, she looked at the relationship of the phenomenon of information literacy and the phenomenon of learning. Her work was unique in terms of studying two phenomena in a single phenomenographic research project. A similar study to her was Limberg's (1999) work, though not necessarily focused on the phenomenon of information literacy. Limberg (1999) instead studied the interaction between the two phenomena of information seeking and use, and learning. She identified how different ways of information seeking and information use result in different learning outcomes. As

another information-related study, Edwards (2006) demonstrated the variation in web-based information searching experiences of university students. Her research contributed to the information literacy agenda by providing insight into teaching and learning information searching.

The relational approach has also been used to view information literacy in community settings. An example is the research series in which health information literacy was scrutinised relationally (Yates, Partridge, & Bruce, 2009; Yates et al., 2012). Adopting the "using information to learn" definition, the researchers analysed how ageing Australians collectively experience information use in order to learn about their health. In their most current research report, the research team suggested five different ways in which older Australians experience health information literacy. These ways ranged from storing information to participating in an informed community. From the same context, however in church communities, Gunton, Bruce and Stoodley (2012) investigated information literacy of people involved in such environments. Growing faith, developing relationships, managing the church, serving church communities and reaching out beyond church communities were the different ways in which people involved in church communities learn.

Interestingly, Bruce's (1997) relational model has been used in non-relational research as well. In their small-scale study, Smith and Oliver (2005) analysed students' behaviour in an information searching and using course based on "seven faces of information literacy" (Bruce, 1997). It is a principle in phenomenographic studies that the outcome of the research is not a categorisation of people but of experienced conceptions, and Smith and Oliver's (2005, p.61) behavioural research reinforced this idea. Their investigation showed that the seven categories of Bruce's (1997) relational model do not define types of students, but shared experiences of information literacy among them.

In spite of efforts for re-conceptualising information literacy from a relational point of view, including the need to newly investigate information literacy in each new context, some have framed their information literacy exploration using the original relational model of Bruce (1997). In her paper, Cheuk (2008) suggested information literacy seen from a relational approach could be introduced in a workplace. She argued that there must be a correspondence between the hierarchy of different ways of experiencing information and the organisational hierarchy. She

demonstrated that in the hierarchy of seven different ways of information literacy, senior and executive managers are required to use the most complex ways while end-users and other lower-level staff take advantage of more simple ways.

As was mentioned in section 2-8, there is a gap between the expert-based theoretical understanding of information literacy and the actual experience of information literacy in the workplace (Hepworth & Smith, 2008). In this regard, one of the advantages of the relational standpoint is its potential to offer a user-based understanding of the concept of information literacy that can lead to a connection between theory and practice. This is due to a key feature of the relational viewpoint, which generates user-based (and not researcher-based or expert-based) descriptions (this will be explained in detail in Chapter 3). Therefore, by studying the experiences of information users in their workplaces, the findings refer to real experiences of information users rather than theoretical understandings of experts. For instance, adopting a relational view and using phenomenography, Boon, Johnston, and Webber (2007), and Williams and Wavell (2007) respectively investigated UK academics' and secondary school teachers' conceptions of information literacy. They were able to perform a comparison between the results of their study and the existing standards and frameworks of information literacy, which were mostly librarian-and-expert-centred. This comparison showed significant differences between the understandings of the two groups (users and information literacy professionals). They advised that these differences should be considered when educating information users. Aligned with Boon et al. (2007), Kirk's (2004) findings gave further evidence of a gap between information literacy conceptions framed by library and information literacy professionals, and the conceptions experienced by information users. Kirk (2004) demonstrated that there is weak correspondence between information literacy education programs delivered by information literacy experts and how this concept is experienced among senior managers in cultural industries. With this respect, it could be said that research outcomes emanating from a relational view of information literacy may contribute to planning for users' or even educators' education.

Having explained the three contexts for situating information literacy as well as three perspectives for viewing it, the next section combines these two areas to specify the gap for the current study.

2-11 Workplace Information Literacy + Relational View of Information Literacy

Up to here, it has been discussed that the present research has its focus on workplace information literacy, one of three main contexts for studying this concept (educational and community contexts being the others). Simultaneously, it was argued that the existing predominant approach for researching information literacy, a relational approach, has been adopted in this research (the behavioural and socio-cultural approaches being the others). Table 2-3 shows these two lenses for viewing the information literacy research domain. In this table, rows are allocated to different approaches and columns are assigned to different contexts. Each cell provides sample studies conducted in the relevant context and through the relevant approach.

It is noted here that information literacy is a concept that stemmed from the library and information science domain, which was a context concerned with learners' experiences. This context shares a great extent of commonality with the education context; therefore the two contexts are brought together in one column (Column 1).

Table 2- 3The crossing of approaches and contexts in information literacy research

<table>
<tr><th>Context
Approach</th><th>Education & LIS</th><th colspan="2">Workplace</th><th>Community</th></tr>
<tr><td>Behavioural
(skill-based)</td><td></td><td colspan="2">Gasteen & O'Sullivan (2000); Rosenberg (2002); Macoustra (2004); Cheuk (2002,2008); Smith & Martina (2004); Kirton, Barham & Brady (2008); Hepworth & Smith (2008); Weiner (2011); Leavitt (2011); Travis (2011); Crawford & Irving (2012); Head et al.(2013)</td><td></td></tr>
<tr><td rowspan="2">Relational
(experiential)</td><td rowspan="2">Limberg (1999); Maybe (2006); Lupton (2008)</td><td>Education & LIS</td><td>Non-education & non-LIS</td><td rowspan="2">Yates, Partridge & Bruce (2009); Gunton (2011); Gunton, Bruce & Stoodley (2012); Yates et al. (2012);</td></tr>
<tr><td>Bruce (1997, 1999); McGuiness (2003); Webber, Boon & Johnston (2005); Boon, Johnston & Webber (2007); Williams & Wavell (2007)</td><td>McMahon & Bruce (2002); Kirk (2004); O'Farrill (2008)</td></tr>
</table>

Socio-cultural (contextual)	Lundh & Limberg (2008); Sundin, Limberg & Lundh (2008); Tuominen, Savolainen & Talja (2005)	Lloyd-Zantiotis (2005); Lloyd (2007) (2009) (2010); Veinot (2007);	Lloyd (2010), Kennan, Lloyd, Thompson & Qayyum (2011); Walker (2012); Lloyd, Kennan, Thompson & Qayyum(2013)

It is important to note that Table 2-3 does not include all existing approaches to information literacy research. Therefore, there may be research that does not fit in any of the nine cells of this table. Moreover, it should be acknowledged that each cell does not comprehensively cover all research conducted in that area. The studies shown are representative research works and this table should not be considered to be exhaustive.

This table will now be discussed in detail, to distinguish the exact position of the present study among other information literacy research.

Within Table 2-3, the cell, which joins the "Education & LIS context" column to the "Behavioural approach" row shows the research that has these two features. As touched on prior to this, a notable share of information literacy research outcomes have resulted both from the educational and LIS contexts (the first column in Table 2-3) and from a behavioural approach (the first row in Table 2-3). Therefore, due to the lack of space here, this cell has been filled with a dark solid colour, which is an indication of the abundance of research in this area, in contrast to the other areas.

The context in which this study is conducted is the workplace context. As is shown in the "Workplace context" column in Table 2-3, the majority of workplace information literacy studies have been conducted with a behavioural approach. Workplace information literacy seen from a behavioural approach is defined as "a set of abilities for employees to interact with information when they need to address any business issues or problems at work" (Cheuk, 2008, p.139). In view of the dominance of the behavioural approach in information literacy research so far, it is not surprising that the amount of research implemented from the other two approaches is still relatively little.

In Table 2-3, this study would belong in the cell in which the "Workplace context" column meets the "Relational approach" row. Apparently, the current study is very similar to the indicative works in this cell, in terms of context and approach. However, for a more detailed view, the "Workplace context-Relational approach" cell is divided into the "Education and LIS-related" and "Non-education and non-LIS" workplaces. This categorisation is the result of exploration of the relevant literature that revealed that the majority of workplace information literacy research adopting a relational view is situated in an "Education and LIS-related workplace" such as a higher degree institution.

One note here is that in contrast to Column 1, which was concerned with learners' experiences of information literacy, in this workplace-related column, educators' and LIS practitioners' experiences of information literacy in their own learning and teaching is of interest. For instance, Bruce's (1999) research included librarians and IT professionals, counselling services staff, staff developers and academics of Australian universities. The three year project implemented by Boon, Johnston and Webber (2007) also can be considered as relational workplace information literacy research in which the workplace has an educational nature. Their study included 80 UK academics in four disciplines – English, Marketing, Chemistry and Civil Engineering. Similar to them, McGuiness's (2003) phenomenographic study was an investigation into information literacy conceptions from the point of view of Irish academics. Considering academics in their workplace, her study was also situated in an educational workplace context.

In Table 2-3, the other section of the "Workplace context-Relational approach" cell is assigned to "Non-education and non-LIS" related research. This section is the exact area of this study. However, as it can be seen, little research has been conducted in this area. Kirk's (2002, 2004) research on the information use of senior managers is a good example in this cell. She uncovered five different ways of experiencing information use, one of the key components of information literacy. Her study was focused on senior managers chosen from two public sector organisations in the cultural industries sector. Her research demonstrated that for the purpose of workplace information literacy education, the two subjective and transformative views rather than the objective view of information have priority. In the objective view of information use, information is regarded as an object, which is

external to users. In a subjective view, information is a construct and internal to the users, which enables them to develop new knowledge (Bruce, 1997). In the transformative view of information use, however, information is seen as a transformative force, which assists in shaping judgement and influencing other people. Adopting the same approach, the current study considered information literacy among web professionals. This resulted in four different ways of experiencing information literacy in this context. These four different ways will be discussed in detail in chapter 4. McMahon and Bruce's (2002) study about the information literacy needs of local staff in cross-cultural development projects is another example in the "Workplace context-Relational approach" cell in which the workplace has a non-educational and non-LIS nature. Similar to Kirk's (2002, 2004) studies, their study was an information literacy-related study, but not an attempt to conceptualise information literacy. The phenomenon they investigated was the information literacy needs of local workers in cross-cultural development projects. Their research uncovered five qualitatively different ways of perceiving information literacy needs among the chosen population. The resultant model of their study showed that in order to meet the information literacy needs of a cross-cultural workplace, a step-by-step approach is required. That is, higher level information needs can only be met when needs in a lower level have been met. Their study also had implications for the level of communication between Western project managers and local staff for obtaining full productivity. The level of communication needed to be matched with the hierarchical level in which the local workers were placed.

In general, this section stated that the situated nature of information literacy requires the concept to be enquired after in individual workplaces. This is essential, considering Lloyd and Williamson (2008) and O'Farrill's (2010) emphasis on the necessity for exploring different workplaces in order to achieve clearer views of workplace information literacy. Additionally, the section mentioned the small number of studies implemented in the area of workplace information literacy, especially from a relational viewpoint. Thus, the importance of conducting further research to explore information literacy relationally and in a new workplace context is highlighted. The outcome of such an endeavour can be considered as one piece of many pieces in a workplace information literacy concept jigsaw puzzle.

2-12 Part 3: Pulling the Context and Object of the Study Together

The evidence presented in Part 1 of the current chapter suggests that despite the recognised influence of web professionals on the websites they create, their professional experiences in the emerging fast-paced industry of website design and development has been relatively under-researched. Drawing upon available evidence, Part 1 shows that among many aspects of their professional experiences, web professionals' information use is chosen to be studied in the current research. Part 1 states that selection of this aspect is based upon a low level of knowledge application among web workers. Accordingly, the perspective of web professionals in their information engagement will be investigated in this research. This point of interest, which constitutes the context of the current study, relates the research to the broad area of information literacy, which is considered as the key object of the study.

Focused on the key research object (i.e. information literacy), Part 2 demonstrates the lack of research into the workplace information literacy, specifically in a non-educational workplace, and thus considers the exploration of this field a priority. Researching information literacy within particular workplaces is critical, noting from existing research findings that training professionals in the fundamentals of information literacy is essential. Moreover, understandings and knowledge about information literacy gained from the educational world are shown to not be transferable to the workplace territory. In line with this, an existing gap between available understandings from these two contexts (i.e. the workplace context and the educational context) is highlighted, which indicates the necessity of identifying the different new ways of describing information literacy suitable for business environments (O'Sullivan, 2002).

From the literature review in Part 2, it is also concluded that the educational methods and content with which workers are trained to engage with information in their workplaces might vary significantly from their fields of practice. Therefore, any effort to educate potential information users in different contexts, disciplines, workplaces or occupations, must be preceded by an understanding of the information literacy experiences of that specific group of users in their context.

All of these indications are drawn upon to form the context and object of the current study. That is, from Part 2, this research intends to investigate the

information literacy experience in a specific workplace. Then, referring to the gap clarified in Part 1, the specific workplace chosen for this research is the environment in which web professionals perform their job. The attained understanding of how web professionals experience information literacy could later lead to an agenda for educating this group of people, prior to and while working in the profession.

Having clarified the gap precisely, the context and object of the current study, the next chapter discusses the methodology of choice for implementing this research. This involves an overview of the methodology and its principles, and therefore how the research should be designed and conducted.

Chapter 3: Research Design

3-1 Introduction

This chapter serves to illuminate the paradigmatic approaches of the study and describes them in relation to the research. The chapter then presents an overview of phenomenography, which is followed by a discussion of the research design consisting of data collection, data analysis and representation of phenomenographic research findings. The chapter is finished with a discussion on rigour in phenomenographic research and associated considerations.

3-2 Interpretive Paradigm

The current research embraces an interpretive paradigm. In contrast to positivism, which believes in realism, or post-positivism that takes a critical realism stance, interpretivism ontologically is relativist (Lincoln & Guba, 1985). This means that in this paradigm, realities are multiple, holistic and complex (not single and tangible). That is, within such a paradigm, reality (or "known", using Pickard's word (2007)) is not objective or something "out there", independent of the individual or discoverable by him or her. Instead, it is constructed based on the meanings that are developed by individuals within social contexts (Creswell, 1994; Pickard, 2007).

As was mentioned above, the aim of the current study is seeking web professionals' experiences of information literacy. This is an investigation into the internal world of web professionals to see how they experience the specific phenomenon of information literacy and constitute meanings for it. With respect to the fact that the main concern of an interpretive approach is interpretation of individuals' constructed meanings, "understanding human thought" (Pickard, 2007, p. 11) or the "subjective world of human experience" (Cohen & Manion, 1994, p. 17), positioning this research within such a paradigm seems an appropriate decision.

The interpretive paradigm also assumes a subjectivist epistemology. From this point of view and in defining "the relationship between the inquirer and the known" (Denzin & Lincoln, 2011, p.12), acquired knowledge is produced as a result of an interaction between the researcher and the subjects of the study. Therefore, the researcher does not endeavour to separate him- or herself from the research situation.

Nevertheless, in order to report only the experience of the research participants of the phenomenon under investigation, the researcher simultaneously aims not to let their subjectivity influence the interpretation of the mentioned experiences. This type of knowledge, which is an interpretation of particular moments, is limited to the time, context and situation of a specific study (Pickard, 2007).

These ontological and epistemological assumptions could be viewed from two different levels in research. At a broader level, the knower is considered as the researcher and the known (i.e. knowledge) is what he/she is seeking, which is an understanding about the phenomenon. In the case of the current study, the known is an understanding about web professionals' experiences of information literacy. This is a researcher-researched relationship, which in the case of the current research is formed between the researcher and research participants (i.e. web professionals). Therefore, based on an interpretive approach and from a phenomenographic perspective, it is understood that the different ways of experiencing information literacy by web professionals do not exist independent of the researcher and it is the researcher who constructs them.

Then, at a more specific level, the knower is seen as the participant involved in the research (i.e. web professionals, in the case of this study), who interacts with the known (i.e. information). In this case and according to an interpretive approach, it is understood that information literacy does not exist independent of the individual people, but it is through the interaction between individual participants and information that information literacy is constructed. Interestingly, this is the same as the subject-object relationship in phenomenography, which is the object of phenomenographic research and will be discussed shortly in this chapter. The interpretive researcher's role here is then to extract these meanings, interpret them and present them as faithfully as possible (Creswell, 1994).

For research within an interpretivist paradigm, the most appropriate methodology is a qualitative one. In qualitative approaches, the research does not generally begin based on a particular theory of the phenomenon under study. The theory and associated knowledge ("known" as discussed above) are instead generated inductively based on data as the research proceeds. In fact, it is people's understanding and experiences that shape the theory of an interpretive research and result in new knowledge. Thus, it should make sense if it is argued that the emerged

theory must then make sense to the target audience of the research (Cohen & Manion, 1994). For instance, in terms of the current study, the generated model of web professionals' information literacy on one hand must be applicable to the community of web professionals including educators, students and practitioners of the field, and on the other hand must be of benefit to the information professionals' community, especially information literacy experts. The relevant qualitative data collection and data analysis techniques that are used in this research will be introduced later in this chapter.

3-3 Rationale for Choosing Phenomenography

Among the many qualitative research methodologies that fit within the interpretive paradigm, phenomenography was identified as the most appropriate one for conducting the current research. Since phenomenography is mainly concerned with the relationship between the experiencer and the experienced ("knower" and "known" or "knowledge" respectively, as discussed above) and not with each of them as separate entities (Marton, 1986), it fits well in the interpretive paradigm of this research. From a phenomenographic point of view, the "experienced" is not something "from the world", nor it is "from the depth of our immortal soul", but it is constituted based on the relationship between the person and the world (Marton & Booth, 1997, p.139).

In addition, phenomenography takes a second-order perspective (this will be discussed later in this chapter), which means it presents a descriptive recording of the experience as reported by research participants, and not the researcher (Livesey, 2006). That is, an effective understanding of web professionals' information literacy experiences which derives from their rich descriptive and subjective thoughts will be yielded using a phenomenographic approach. However, the researcher's role in converting the participants' expressed experiences into the reportable outcome of the research is acknowledged here. The researcher constitutes the outcome of the research intentionally and based on her interpretation of the data collected from the participants (Sandberg, 1997). Therefore, taken together, the more specific theoretical approach of this study can be considered as interpretivist phenomenography.

Having said that, the primary reason for choosing phenomenography is due to its main feature in comparison to other methodologies, which is uncovering variation in people's experiences (Åkerlind, 2005b; Marton, 1981; Marton & Pang, 2008). Therefore, since the aim of this study is to identify the different ways, rather than similar ways, in which web professionals experience information literacy, phenomenography is the methodology of choice. The resulting knowledge of variation is expected to be of use specifically in education of two separate groups of individuals: future web professionals and information professionals. This is especially due to the strength of phenomenographic studies in supporting educational outcomes and the development of pedagogical frameworks (Prosser & Trigwell, 1997; Trigwell, Prosser, & Ginns, 2005).

3-4 Overview of Phenomenography

Phenomenography as a research approach evolved during the 1970s at the University of Gothenburg, Sweden. It is a qualitative, interpretive and descriptive research approach that is:

> adapted for mapping the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and phenomena in, the world around them (Marton, 1986, p.31)

This simply means that phenomenographic research is looking to find how different people experience the same phenomena in critically different ways and how these experiences are related and therefore mapped.

Phenomenography has its origins in the field of education. However, it has been also applied to various fields beyond education (Pang, 2003). Studies on the understanding of death (Wenestam, 1982), political power (Theman, 1983), competence (Sandberg, 1994, 2000), Nobel winners' views of scientific intuitions (Marton, Fensham, & Chaiklin, 1994) and environment (Loughland, Reid, & Petocz, 2002) are good examples of phenomenographic studies beyond the educational context. Similarly, the effort to gain an understanding of the experiences of "information literacy within a website design and development context", which is the aim of the current study, is another example of this case. In fact, this is an endeavour

to portray another concept out of the many "conceptions of the world around us" (Marton, 1994, p.4428).

Prior to describing the application of phenomenography for the current study, several important principles, rules and assumptions within phenomenography should be explained. This is done in the next section.

3-4-1 Second-order Perspective: Looking through the Eyes of Others

All phenomenographic studies adopt a second-order perspective. This is different to taking a first-order perspective in which the researcher describes her/his own understanding about phenomena in the world or interprets them "as they are" (Marton & Pang, 2008, p. 535). In a second-order perspective the description is produced based on other people's ways of experiencing the world rather than the researcher's. In other words, phenomenographers try to see phenomena through the eyes of other people. The source of data in phenomenography, therefore, is people's understanding (Svensson, 1997) or simply what is said in interviews. This approach then would result in an understanding of how people experience a particular phenomenon, but not how the researcher understands that phenomenon (Marton, 1981).

Moreover, using a second-order perspective is a necessity for achieving the goal of phenomenography, which identifies different ways of experiencing a phenomenon. Identifying "different ways" of experiencing or seeing something requires looking at it through different eyes which justifies using other people's rather than an individual researcher's experiences of the phenomenon under investigation (Marton, 1981).

3-4-2 Experience: The Relationship between Subject and Object

Phenomenography studies the variation in experiences of people of a particular phenomenon. As mentioned above, the epistemological positioning of constructionism, which underpins the interpretive paradigm of this study stresses the interaction between a "knower" or experiencer and a "known" or experienced (Pickard, 2007). This position necessarily needs a subject (human being) to experience, and an object (the world around him or her) to be experienced. Based on this positioning, in phenomenography, neither the subject, nor the object can exist

without the other. In other words, subject and object are not being considered separately or independent of each other, but in a relationship. This is a human-world relationship, which is based on Brentano's (1973) notion of intentionality. Based on the principle of intentionality, the subject and object together are considered in the form of a subject-object internal relationship (Linder & Marshall, 2003). This relationship is called *experience* and the stance in which subject and object are viewed inseparable is called a non-dualistic view in phenomenography (Marton, 2000; Marton & Pang, 2008).

During a lifetime, an individual person (i.e. subject) experiences unlimited situations and phenomena (or objects). It is also the case that different people experience a specific phenomenon a few times, several times or every day in different locations or contexts. It is through these experiences that an individual makes sense of different aspects of his/her world or different people constitute the sense of different aspects of a specific phenomenon. In phenomenography, these ways in which the phenomenon is experienced are called *conceptions* (Sandberg, 2000), which has been taken as equal to *experience* in this research.

Experiences or ways of experiencing a phenomenon are the unit of phenomenographic analysis (Marton & Booth, 1997; Marton & Pong, 2005). This means that the "object" of a phenomenographic study is the internal relationship which is formed between the subject and object (i.e. people and the phenomenon or experiencer and experienced). Therefore, the aim of phenomenography is to describe this relationship, rather than the subject or the object (Svensson, 1997). This is shown in Figure 3-1.

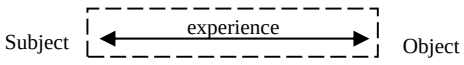

Figure 2-1 The object of phenomenographic research

It should be noted here that the word "experience" is a key word in phenomenography. However, other terms such as "conceptions", "understanding", "ways of experiencing", "ways of understanding", "ways of seeing", "ways of conceptualising", or "perceptions" are also used interchangeably in the literature for communicating about the object of phenomenographic investigation (Åkerlind, 2005c; Lupton, 2008). The main terms used in this research are "experience" and

"ways of experiencing" due to their simplicity for communication. However, "understanding" and "ways of understanding" are also used.

From the argument above, since a phenomenon is experienced by different people, at different times and in different situations, it could be concluded that there might be many ways of experiencing that phenomenon, by which the phenomenon makes sense for people in those contexts. However, many of these ways are similar to each other in terms of their meaning and these could be grouped together. Interestingly, at the same time, there are groups of similar ways that are qualitatively different from each other. However, in relation to each phenomenon, there only exists a limited number of these qualitatively different groups (i.e. experiences). Otherwise, communication about a phenomenon among people experiencing it would not be possible, due to the many diverse experiences of that phenomenon (Marton & Pang, 2008). This argument is shown simply in Figure 3-2. Some ways of experiencing a phenomenon are not very different from each other and are grouped together within circles to form one unique way of experiencing, shown with a thick arrow for each circle. These thick arrows are called categories of description in phenomenography and each of them is a representation of one way of experiencing the phenomenon.

Different categories of description of a phenomenon are logically related to each other, to establish the outcome space of the phenomenon. The outcome space is a representation of the object of the study (i.e. the phenomenon in question) (Marton, 2000) and is the final product of a phenomenographic study (Marton, 1986). The discussion of the categories of description and the outcome space constitute the next section of this chapter.

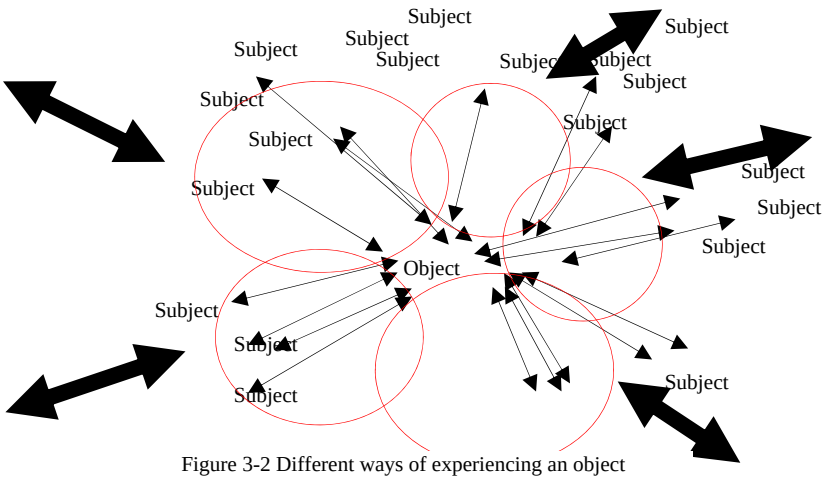

Figure 3-2 Different ways of experiencing an object

3-4-3 Categories of Description

In the process of data collection, participants of phenomenographic research reveal their relationship with the phenomenon under investigation. This includes describing the way(s) in which they experience the object of the study and the meanings they individually perceive about it. Åkerlind (2005b) reminds phenomenographers that although each participant's relationship with the phenomenon under investigation is unique, a descriptive report on a single participant's relationships is not of much power for making educational change. She states the expressed relationships are more useful if the qualitative variation between them is illustrated in identified qualitatively different ways. Therefore, at the time of analysis, the researcher seeks the meaning of these relationships. He/she then constructs a set of logically related categories of description by grouping similar ways of experiencing in terms of their core meaning (Marton, 1986). In Svensson's words (Svensson, 1997, p.168) "a category is a description of what is the common meaning of the meanings (i.e. experiences, in the language used in this research) of a phenomenon grouped together". Marton (1994, p. 4428) describes it as a characterisation of the qualitative "variation in how a certain phenomenon is experienced, conceptualised, understood".

Categories of description are a result of a reduction and abstraction of the research data (Svensson, 1997, p. 167). This, in practice, means that the hundreds of pages of transcribed interviews collected should be searched for common meanings and condensed to several phrases and sentences and "to a limited and pregnant form".

An important discussion about forming categories of description is whether they are constructed or discovered by the researcher (Walsh, 2000). With respect to the fact that the categories of description are built from the relationship between participants and the phenomenon under investigation, Walsh questions if the researcher constructs those relationships or discovers them? The approach used in this research is a combination of both. That is, although it is acknowledged that the relationship between the participants and the phenomenon exists and therefore is discoverable in data, the researcher admits her role in interpretation of those relationships and constructing the categories of description. That is, in a co-constitution process, the researcher receives the product from the participants and

constructs the categories of description using them (Bowden, 2000). It has been argued that a researcher's interpretation might impose bias on the core goal of phenomenography, which is to report the participants' (and not the researcher's) understanding (Ashworth & Lucas, 2000). The justification of how the balance between taking data from participants' and constructing the researcher's interpretation is maintained is described in Section 3-4-8.

Concerning the co-constitution viewpoint in forming categories of description, the researcher should follow two aims: (a) to abstract the data from entire transcripts to a limited form; and (b) to represent a summary expression of the meaning as close to the data as possible (Barnard, McCosker, & Gerber, 1999; Svensson, 1997). These expressions from which the categories form are presented as qualitatively different aspects of the phenomenon as it is understood. Categories of description are distinguishable through these different aspects (Lupton, 2008).

In general, all categories of description have four characteristics in common (Marton, 1988b). First, categories of description are "relational" in terms of dealing with meanings through which the relationships between the subjects and the object of the study forms. Second, they are "experiential" in terms of being developed on the basis of participants' experiences. Third, they are "content-oriented" in terms of being focused on the content or meaning and not words or language used. Finally, the categories of description are "descriptive" or qualitative in terms of being based on descriptions provided by the researcher.

3-4-4 Outcome Space

The main result of a phenomenographic study is an outcome space of the phenomenon. It could be said that if categories of description are a representation of collective experiences, the outcome space is the representation of the phenomenon in question (Marton, 1994, 2000). Nevertheless, as it will be seen shortly, this is not a universal representation and it is dependent on the research population, context and time. The outcome space is "the logically structured complex of the different ways of experiencing an object" (Marton, 2000, p.105). In other words, it is a structure that puts the set of categories of description together to depict the variation in understanding an object. In such a structure, the logical relationships between and within the categories of description is manifested (Åkerlind, 2005b). It is through the

outcome space that the collective varied experiences of the phenomenon are illustrated (Marton & Pong, 2005).

Phenomenographers have recognised different forms of structure that relate the categories of description in an outcome space. The most frequently demonstrated structures have been hierarchical or nested structures (Lupton, 2008). In a hierarchical structure, the complexity of the described experience increases in higher categories (Bruce, 1997). Meanwhile, a nested structure includes lower categories within higher categories (Åkerlind, Bowden, & Green, 2005). In both cases, lower categories reflect less "powerful" or complicated ways of experiencing the phenomenon (Åkerlind, 2005a). However, the structure may also be in the form of a horizontal structure with equal categories or a vertical structure with differences in the content of categories (Järvinen, 2004). An important point to note here is that due to the focus in phenomenography on the qualitatively different features of constructed-discovered categories of description, there cannot be any overlapping of them in the outcome space structure (Marton, 1988a). The overlapped areas in the inclusive structure of nested categories of description, however, are exceptional. In a nested structure, each category is more comprehensive in compare to the category inside itself. In Figure 3-3 the ways categories relate together in hierarchical (the left side) and nested (the right side) outcome spaces are portrayed.

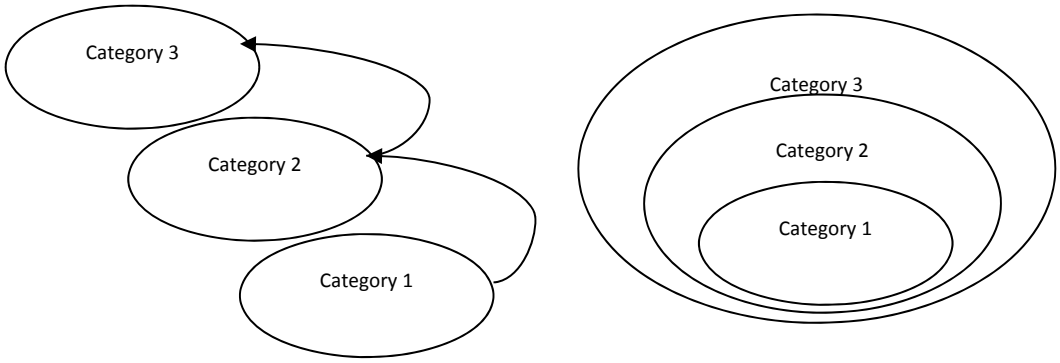

Figure 3-3 Hierarchical (left) and nested (right) outcome spaces

As mentioned previously, an important emphasis in discussing the outcome space is the limited number of categories (Marton & Pang, 2008). However, the outcome space of a phenomenon should not be seen as a complete portrait of it. That is, it is not a representation of the entire range of possible ways of experiencing that

phenomenon (Åkerlind, 2005a; Barnard, et al., 1999). This might vary across different research participants, from different contexts and different times. Therefore, an outcome space containing all possible ways of experiencing the phenomenon would be an ideal outcome space (Pramling, 1995). Aligned with this view, Åkerlind (2005c) asserts that each outcome space of a particular phenomenon can shed light on only one part of it. Outcome spaces, from this perspective, are comparable in terms of their completeness.

If a general view of the phenomenon under investigation is portrayed through the outcome space, a more specific view is demonstrated through the categories of description. Moreover, there is an even more detailed level of discussion than the categories of description, which occurs when talking about the referential and structural aspects of those categories. These are discussed in the next section.

3-4-5 Referential Aspect, Structural Aspect

A phenomenon is investigated in terms of two related and intertwined aspects: a referential aspect and a structural aspect. The referential aspect is the meaning that research participants assign to each individual experience. In simple words, it manifests "what" is seen. The structural aspect reveals the way the participant is aware of the phenomenon when seen from that point of view. It demonstrates the arrangement of and relationships between elements of each category of description, and all the discovered categories of description of the phenomenon. In simple words, the structural aspect discusses "how" participants are aware of a phenomenon. In general, the structural aspect is about an act and the referential aspect is about a thing that the act has happened to be upon (Trigwell, 2000).

At the time of analysing the research data, the focus of analysis might be on either aspect. However, a complete understanding of different ways of experiencing the phenomenon under investigation is only possible by considering the referential and structural aspects together. Moreover, the outcome space which represents the relationships between and within categories is constituted from these two related aspects (Lupton, 2008). The close relationship between these two aspects has also been emphasised by Marton and Pong (2005). However, they discussed that this relationship is only distinguishable if the participants' responses include concrete examples. Otherwise, through abstract conceptual responses, shifts in focus or brief

expression, the structural and referential aspects will not be distinguishable. Moreover, in order for the meaning of each category to be clearly presented, each category is required to be viewed as a link to the whole related set (Lupton, 2008).

It was mentioned that each category is constituted from the "common meaning of the meanings of a phenomenon". Moreover, the referential aspect places its emphasis on the differences between the main foci of the categories of description (Åkerlind, 2005b). This means that the referential aspect focuses on the meaning of each way of experiencing the phenomenon under investigation. Regarding these two statements, it could be understood that while talking about the referential aspect, the focus is on the categories themselves. Similarly, as has already been noted above, the outcome space considers the relationship between and within the categories of description. The word "relationship" implies a kind of structure, which resembles the structural aspect. Therefore, it is understood that any discussion of the outcome space will include a strong focus on the structural aspect.

It is emphasised here that when talking about the structural aspect, not only the relationships between categories, but also the relationships within the categories are studied. These are relationships between (a) aspects that are in the focus of awareness of participants when they are experiencing the phenomenon, (b) aspects that are in the context of that focal point, and (c) aspects that are in the margin of awareness of participants. The structure in which these three areas of awareness are related to each other is called the "structure of awareness" (Marton & Booth, 1997), which is discussed in the next section.

3-4-6 Structure of Awareness

Moving one step forward into the anatomy of an outcome space, within the structural aspect, the "structure of awareness" manifests itself. The structure of awareness involves the relationships of aspects of variation within each category. This is a structure comprising of two main sections: the "internal horizon" and the "external horizon" (Marton, Dall'Alba, & Beatty, 1993). A more detailed version of this structure, first introduced by Gurwitsch (1964), includes three areas of "theme", "thematic field" (or background) and "margin". The theme sits within the internal horizon, and the thematic field and margin fit within the external horizon.

The theme, where the main focus of awareness is located, is where the directly experienced aspects of the phenomenon sit. These aspects are “fore” and “figural”. The next level surrounding the focal point of awareness is the thematic field, which provides the context for the theme. Then, around the thematic field is the margin of awareness. In this area, the experienced aspects are in relationship with the phenomenon only in terms of having a time and spatial coexistence with it (Marton, 2000). Describing the structure of awareness for each category in depth helps achieve a more detailed and communicable analysisof an experienced phenomenon (Edwards, 2006). This approach will be used in the current study.

3-4-7 Dimensions of Variation

The whole of a phenomenon, its constituent parts and the relationships between them, is described in terms of different aspects. In all ways of experiencing a phenomenon, there exists a set of aspects in common, however the value and characteristics they receive have a potential for variation across those different ways of experiencing (or categories of description). Therefore, it could be concluded that individuals are aware of the phenomenon in terms of these aspects, however with a possible variation in their value and characteristics. In other words, variation in the awareness of individuals towards a phenomenon is described through a set of these aspects and their corresponding value and characteristics. In phenomenographic language, these aspects are called dimensions of variation (Marton & Booth, 1997).

According to 3-4-3 to 3-4-7, the analysis in the current research will result in:

- A set of limited number of ways of experiencing information literacy (categories of descriptions). It should be noted that there has been other research that has explored the variation in experiencing the phenomenon of information literacy (Bruce, 1997). However, this has happened from the perspective of a different group of subjects. In the case of this research, the explored variation has been from the perspective of web professionals. These categories of description will be described from two aspects:
  - Referential Aspect: The referential aspect is about the universal meaning of each category.
  - Structural Aspect: The structural aspect represents the structure of awareness of individuals in each category. This includes a theme or

focus of awareness, which is a key element of experiencing information literacy. Additionally, there is a thematic field or background and a marginal area surrounding the focal point of awareness, which include less important experienced elements of the phenomenon from the perspective of participants. These elements are not experienced as clearly as the elements in the focal point or there is a vague image of them in the participants' view. In the second case, it is probable that they are only experienced at a particular point of time or in a specific context. Alongside the different zones of awareness, there will be also dimensions of variation.

- The outcome space, which depicts how these categories of descriptions relate to each other.

So far, a general understanding of phenomenography has been presented. The next section discusses the practice of phenomenography in this research. However, before moving to that section, another phenomenographic principle needs to be described. This principle is called "bracketing". It explains how the researcher takes a second-order perspective throughout the process of data collection and analysis, in order to ensure the description of participants' experiences and not her own.

3-4-8 Bracketing: The Methodological Glasses for Second-order Perspective

Based on the goal of phenomenography, the researcher needs to describe critical variation in experiencing the phenomenon in question from other people's standpoint (and not her own point of view). This implies that the researcher looks at the object of the study through the eyes of others and describes how *they* experience it rather than how the *researcher* herself experiences it. It is, however the researcher who forms the interpretations from which the outcome of the study is derived. Hence, it can be concluded that his or her subjectivity might influence the interpretation. This poses two questions: (a) how would it be possible to rely on the outcome as the participants' (and not the researcher's) experience of the phenomenon?; and (b) what happens to the researcher's past and present knowledge about the phenomenon in the interpretation process?

The answer is that the researcher is required to suspend predefined relevant knowledge about the phenomenon. That is, the phenomenographer needs to set aside

all “assumptions” or “presuppositions” (Ashworth & Lucas, 2000, p. 297-298) and relevant “theories and prejudices” (Sandberg, 1997, p. 209) he or she is aware of when interpreting and describing the ways individuals experience the phenomenon in question. Although it has been argued that the phenomenographer might not be able to follow this principle one hundred percent of the time (Lupton, 2008), there is a strategy to deal with this. Acknowledging that the researcher’s background might interfere and suggesting ways for dealing with it throughout the process is called interpretative awareness, which is used for adjusting the reliability of the research (Sandberg, 2000). The practical application for it is called bracketing, epoché or phenomenological reduction.

Bracketing is used to minimise bias in interpretive research approaches such as phenomenography. Therefore, the reliability of the current research was assured by following the bracketing principles. These principles have been considered in the whole process of this research such as data collection and data analysis. These considerations for each stage are discussed in their relevant position later in this chapter.

3-5 Phenomenographic Research Design

This section discusses the data collection and analysis process of the current study. It describes who the participants of this study were, why interviews were used as the tool for collecting data and how the series of interviews were conducted. A description of the data analysis process is also included.

3-5-1 Data Collection

Having clarified the purpose and strategies of doing a phenomenographic study, the next step is collecting data. Data collection, like other stages of phenomenographic research, is undertaken with the specific purpose of the study in mind: shedding light on the ways in which participants experience the phenomenon under investigation (Bowden, 2000). Within the current study, data collection, therefore, aimed to shed light on the qualitative variation in experiencing information literacy among web professionals.

Data collection within the phenomenographic approach is conducted in an open and explorative way (Svensson, 1997). For the purpose of this research, and

based on the phenomenographic research processes proposed by Bowden (2000), the researcher addressed three questions while preparing to collect the data: (a) from whom the data was to be gathered; (b) why a particular method of data collection was chosen; and (c) how the data collection would be conducted. These three points are discussed in detail below.

- **Phenomenographic Interview – Who?**

Data in a phenomenographic study is collected from a particular group of people who have a relationship with the phenomenon being researched. This relationship is explored within a context, as the object of the study (Barnard, et al., 1999). For the purpose of this study, the context is the website design and development industry. Therefore, the participants were selected from this area of practice. For a better view, the research participants are now discussed from three aspects: a) who were they (i.e. research population); b) how they were selected (i.e. sampling technique); and c) how many participants were interviewed for this research project (i.e. sample size).

- Research Population

The purpose of this research is to reflect a variety of experiences of information literacy among the population of web professionals. Since this study was one of the first studies that explored information literacy within an industry (i.e. website design and development), the aim was to generate an understanding across a wide population of relevant professionals. To achieve this goal, and tested through a pilot study, instead of approaching a specific sector of professionals within the industry, the research population boundaries were expanded to cover all typical team members of a website design and development project. This therefore included people practising through the whole process of website design and development. These people came from different levels and stages of the process to ensure that a collective voice was heard. This means that all people involved in a website design and development project, regardless of their titles, were eligible to be invited to participate in the interviews. Therefore, the final research sample included a range of participants, from decision makers at macro-levels of the design process to programmers and coders at micro-levels of the design process. A detailed range of specialties was shown previously in Table 2-2 in Chapter 2.

Based on this, participants were selected among those who had at least one of the following responsibilities: determining, assessing and analysing the website's objectives, target audience and user needs; contributing to information architecture; creating prototypes; researching and providing the content materials for the website; developing/writing/editing the content; constructing the technical side of the site; evaluating and providing feedback on content, design and performance; and constantly maintaining the website.

Having said this, referring to the phenomenographic approach, the researcher was required to ensure that all participants were talking about the same phenomenon, which was information literacy. Thus, she needed to make sure that the participants were all representative of one particular context.

The literature review revealed the completely different nature of design and development activities and practices. Therefore, it could be presumed that people practising at each end of the process may reflect on the phenomenon in question from two thoroughly different perspectives, as if two different phenomena were being researched. As was demonstrated when reviewing the literature, website design and development is a process involving two major sides: the technical side and the artistic side, or functionality and look. That is, a website design and development process might generally include IT professionals who develop the site technically, as well as designers who are engaged in the structuring and graphical design of the website. Therefore, it might be argued that people engaged in these two separate practices could be considered within two separate contexts, which in turn causes bias to the outcome of the research. However, it should be noted that as a result of overlaps between these two aspects, building websites is normally considered a continuum on which web professionals practice occurs along the full spread of it. As a result, the researcher can be sure that the participants were all from one, and not two different contexts. Moreover, it is clarified here again that the aim of this study is to explore variation in experiences of information literacy in the broader domain of website design and development. Therefore, the differences in professional perspectives along the continuum are absolutely in line with this goal of phenomenography. Additionally, consideration of the whole process as a continuum was confirmed through a pilot study, which was implemented prior to the launch of the main study.

The pilot study, involved five interviews with people from various sections of the process, including people collaborating from the early stages of defining and planning through to the final stages of coding the designed structure, and revising and evaluating the built product. The findings of the pilot study proved that although web workers at different stages undertake different jobs and activities, they all aim for one ultimate goal, which is delivering the final product (i.e. website). Therefore, including all people involved in a website design and development project did not seem to generate bias and jeopardise the trustworthiness of the results. For further justification, the distribution of types of participants was balanced by choosing one third of interviewees from each of the three different areas (i.e. design, development and combination of the two). The distribution is shown in Table A1 in Appendix 3 – Research Participants Distribution. The research population also included web professionals regardless of the type of websites they were involved in building.

- Sampling Technique

The sampling technique used in a study must be selected in light of the purpose of the research as well as the research design. That is, the most appropriate sampling technique is the one that has the closest match with the research design (Pickard, 2007).

The sampling approach in a phenomenographic study is purposive (Boon, et al., 2007). The aim is to gain as much demographic variation as possible in research sample. In this way, the most possible variation with respect to the target population's views may be achieved (Bruce et al., 2004; Trigwell, 2000). This is aligned with the main goal of a phenomenographic study which is exploring variation in the meaning of a phenomenon (Åkerlind, 2005b). However, accessing web professionals was not as easy as accessing the websites they create and make accessible on the web. Therefore, snowball sampling, a form of referral process, was used to locate the target population. Using this purposeful research participant recruitment method, the researcher asked each interviewee to assist in identifying other potential participants that met the specified criteria (Fossey, Harvey, McDermott, & Davidson, 2002). Taking advantage of this method, the researcher was able to grow the sample population as the research progressed. The other advantage of applying this technique was its ability to build the specific type of

sample which was aligned with the purpose of a phenomenographic research: maximum variation of sample case, mentioned above (Pickard, 2007). Focusing on a sample case that includes maximum variation provides a good context for a phenomenographic investigation, which follows the goal of revealing variation in experiences.

For the purpose of this research, following the original method of snowball sampling, the researcher contacted accessible key informants in the field and through them accessed other informants. This process started with the first pilot interview in the most approachable team, which was the website development team at QUT, the researcher's own university. From there, the interviewee referred to other potential interviewees, who were also key informants in the field. However, it should be acknowledged that not all the referred people were willing to participate in the interview. Therefore, in several cases the researcher had to advertise the research to recruit participants. This was implemented through advertising the study in social media such as LinkedIn, Facebook, and Twitter. Example advertisements for Facebook and Twitter are included in Appendix 4 – Social Media Advertisement.

- Sample Size

Two factors impacted the sample size of this study. The first factor was the qualitative nature of phenomenography, which requires a smaller sample size in comparison to quantitative research. The second factor was associated with the sampling process in which data was collected until saturation was observed in the data gathered (Pickard, 2007). In phenomenographic research projects, this termination might happen after interviewing different numbers of participants. With this in mind, although the sample size in phenomenographic studies can not be predetermined, a group of 15 to 30 participants is often considered a suitable sample size. It is believed that this participant group size allows elicitation of as many different views as possible without generating a prohibitively large amount of data to analyse (Bowden, 2005; Trigwell, 2000). However, there have been studies conducted out of this range. Bruce's (Bruce, et al., 2004) study with 13 interviewees, Soon and Barnard's (Soon & Barnard, 2001) study with 2 interviewees and Patrick's (Patrick, 2000) study with 33 interviewees are examples of phenomenographic studies with sample size outside the normal range.

For the purpose of this research, 25 web professionals (12 female and 13 male) were interviewed. From this number of interviews, five of them were pilot interviews, which were run to test the research population, interview questions and interview skills. After conducting all the interviews, since the last three pilot interviews had successfully generated relevant data, the researcher decided to enter them into the data pool. Therefore, 23 interviews in total were analysed for the main study. The interviewees' details are available in Appendix 3 – Research Participants Distribution.

Having talked about the research participants, the next section describes why the interview was adopted as the method of data gathering in this study and how the interviews were implemented.

- **Phenomenographic Interview – Why?**

Most phenomenographic research uses semi-structured interviews for gathering the required data (Marton, 1994). This research was not an exception. The preference for using interviews over other techniques for data collection relates to the power interviews give to the interviewer to explore the depth of the participant's thinking (Trigwell, 2000). A one-to-one conversational interview allows the researcher to focus on the participant and encourage the participants to reveal his or her way(s) of experiencing the phenomenon under investigation. The researcher is able to ask questions according to the situation and probe what the interviewee is saying to explore its meaning.

In general, the three main reasons for choosing the interview as the data collection technique in this research, based on Kvale (1983), are its capability of (a) ensuring that the interviewee is talking about the intended phenomenon; (b) conducting an interpersonal interaction; and (c) focusing on certain aspects of the phenomenon chosen by the interviewee.

- **Phenomenographic Interview – How?**

As mentioned above, the preferred method of data collection in phenomenographic studies is the individual interview. This method was utilised in the current study as well. However, it is acknowledged that researchers may take advantage of any other source of data which gives them insight into the different

ways in which people understand the world around them (Marton & Booth, 1997). This can include videos such as in Lindahl's (1996) study, observations such as in Edwards's (2006) study, written data such as in Bruce's (1997) study, group discussions such as in Williams and Wavell's (2007) study and information from questionnaires such as in Cope's (2002) research project. In the case of the current research, only the interview technique was used to gather the research data, as the outcome of the pilot study suggested the suitability of this technique for the study.

For the purpose of the research presented here, a total of 25 interviews were conducted. This included five pilot interviews and 20 main interviews. Out of this number, the data obtained from 23 interviews (three pilots and 20 main interviews) were analysed. The data obtained from the first two interviews were not included in the data pool due to irrelevancy of the generated data in those interviews. This is explained in more detail in Appendix 2 – Pilot study.

The length of the interviews was between 30 and 60 minutes, except for one interview, which lasted only 15 minutes. However, due to its rich content, it was included in the data pool.

In all the interviews conducted for the current study, as soon as the interview started, a relationship between the researcher and the interviewee began to form. This was the kind of relationship through which experiences were explored and therefore was of great importance. As a result, the researcher did her best to put participants at ease and establish a rapport with the participant. Several example strategies will be mentioned shortly in this chapter when discussing the role of the researcher.

Similar to other phenomenographic interviews, the researcher's goal in the interviews was to guide the participants to reflect upon their experiences of the phenomenon being explored during the interview. It is important to bring the interviewees to "a state of *meta-awareness*", to be aware of their awareness of the phenomenon, through this relationship (Marton & Booth, 1997, p. 129). As a result, the implicit and unthematized aspects of the participants' experiences became explicit and thematized which is also a benefit of having dialogue with the interviewee (Marton, 1994). This was mainly done with the aid of asking follow-up questions, which will be discussed in the next section: interview questions.

During each interview, the two-level interviewer-interviewee relationship mentioned by Marton and Booth (1997) was observable: level one had an every-day discourse structure whereas in level two the interviewee experienced a quasi-diagnostic situation. That is, while level one had an ice-breaking nature, by level two of the interview the researcher needed to bring the interviewees' focus on to the reflection or reinterpretation of their previously expressed thoughts. However, in some cases, the interviewees rejected their previously expressed thoughts and ideas and even actively denied or resisted them. Therefore, the researcher needed to be aware of suitable strategies to break down or bypass the interviewees' defences. Proposing suitable questions and interjections in response to the interviewees and maintaining a safe distance from them were two good strategies that the researcher applied, in line with normal practice in phenomenographic interviews to prevent the relationship breaking down. That is, while the researcher probed the underlying meaning of the interviewees' experiences as much as possible, she was also aware of not pushing them too far in answering questions.

Similar to general phenomenographic interviews, the conducted interviews included two main parts. In the first part, the phenomenon being investigated was introduced to the participant in a concrete and open form. The questions in the second part, then asked the participant to discern and abstract the solid and tangible phenomenon from its context and reflect intentionally on their experience of the phenomenon.

The different nature of the two parts of the interviews were clearly observable in the questions posed. The questions of the first part (contextual questions) engaged the interviewees in a situated theme, while questions asked in the second part (primary questions) required them to reflect on the theme. The situated theme as applied in the current study was anywhere in the process of website design and development where the interviewee belonged and used information. It should be noted here that different phenomenographers may have their primary focus on either of the parts of the interview (Marton & Booth, 1997). Furthermore, the departure point for the interview could be either of these parts (Marton, 1994). In the case of the present research, although the interviews all started with asking contextual questions (first part), the primary focus was on the second part, from which more intended experiences for the purpose of the research could be extracted. The type of

questions asked in either part will be discussed in the next section, which is mainly focused on the interview questions.

In conducting the interviews for this research, Kvale's (1983) recommendation concerning features of a well-conducted qualitative interview were applied. The researcher believed that these recommendations were applicable to phenomenography, as it is a qualitative research approach. According to Kvale (1983), the researcher tried to keep the interviews "theme centred, interpersonal, based on an assumption of shared meaning, qualitative in nature, descriptive, particular in intent, presumptionless, supported by minimal ambiguity, able to be altered, sensitive to each person, focused on a phenomenon, and a positive experience for all people" (cited in Barnard, et al., 1999, p. 222). It should be acknowledged that not all the conducted interviews for this research covered all the features above. However, it was observable that well-conducted ones were able to assist the interviewees to express and reflect on the phenomenon fruitfully.

In continuing the discussion about the "how" aspect of phenomenographic data collection, the two sub-aspects of "interview questions" and "role of the researcher" are of great importance. They are discussed separately in the next two sections.

- Interview Questions

The questions in the interviews, like other phenomenographic studies, needed to be designed in a "diagnostic" way to ensure that they illuminated the variation in experiencing the phenomenon being explored (Bowden, 2000, p. 8). Questions relating to different situations enabled the interviewees to express different experiences (Marton & Pong, 2005). This was one of the unique characteristics of phenomenographic data collection, in that it allowed the interviewees to reflect on whatever aspects they were personally conscious of.

For the purpose of this study, six pre-set entry questions were designed, tested and refined via five pilot interviews. The main changes were made after the first and second pilot interviews. The other three pilot interviews confirmed the changes made. A detailed discussion of the pilot interview questions and how they changed is provided in Appendix 2. It is emphasised here that although the pilot interviews served as a quality check for the interview questions, their other role was to give insights into the research population.

The final interview questions were:

1. Describe how you design/develop a website upon your whole job experience in the website design and development area.
2. Describe how you understand website design.
3. What is information for you during the design process? (What are the factors that you take advantage of to design a website?/ What is information for you?)
4. Describe a time that you used information effectively to design a website.
5. How do you use information effectively to design a website?
6. How do you know if you have used information effectively?

Based on the structure of the two main parts of the interview mentioned above, two types of questions were asked in the interviews. These were "contextual" and "primary" questions (Åkerlind, 2005b, p. 106). The interviews all started with two contextual questions (Questions 1 and 2), which encouraged the interviewees to talk about their experience of the phenomenon being explored. These two questions about the background in which the phenomenon sits (i.e. website design and development) set the scene and acted as icebreakers at the beginning of the conversation. As may be understood from their name, the contextual questions had the role of preparing the context for the primary questions, which came next.

The primary questions were of two types: firstly, open-ended questions (Questions 3, 5 and 6) probed the meaning of the phenomenon for the interviewee. The nature of the open-ended questions let the interviewee approach the questions from the aspects that appeared most relevant to them (Bowden, 2000). The second group of questions asked the interviewee to give concrete examples of the phenomenon being studied. Question 4 had such nature. During the interviews, with Questions 5 and 6, the interviews entered a phase in which the phenomenon was abstracted from its context and the general view of the interviewee of the phenomenon was sought.

Among the questions asked in a phenomenographic interview, there are follow-up questions (or probes) that are asked depending on the interviewee's responses. These questions are only asked in the interview only if they are required. In this way, they permit the interviewees to reflect on their experiences of the

phenomenon as fully as possible and illuminate any unclear and vague areas of discourse (Barnard, et al., 1999). This approach aligns with Marton's (1994) view of starting phenomenographic interviews with a few questions without determining too many details. As mentioned earlier, proposing questions and rephrasing them (Åkerlind, 2005c) according to the situation and based upon what the interviewee has already said, is considered another advantage of the interview technique for interpretivist phenomenographic data collection. Examples of follow-up questions used in this study are:

- Could you tell me more about that?
- What do you mean by that?
- Could you give me an example?
- Is there anything else you would like to add? (Bowden, 2000)

In many cases, the follow-up questions were more effective than the structured questions in eliciting the interviewee's underlying meanings. This mainly happened when the interviewees were reflecting on their experiences from the external horizon of understanding (Bruce, 1992 cited in Barnard et al., 1999). As mentioned prior to this, there are two levels of understanding for each interviewee's reflection: the internal horizon and the external horizon. (Marton, et al., 1993). When expressing ideas which belong to the internal horizon, the interviewee has a clear and well-defined understanding of the phenomenon. Therefore, providing further follow-up questions is not necessary. In expressing the ideas that belong to the external horizon, however, the interviewees are not able to explain their understanding clearly. This could be often a reflection that occurs when being asked about something for the first time. The role of follow-up questions or prompting was highlighted at this stage of the interview when the interviewee is not able to express themselves clearly. With the assistance of "supportive prompting" (Barnard, et al., 1999, p. 222), the interviewees were helped to describe their understanding of the desired aspect of the phenomenon under investigation more clearly.

In using the follow-up questions two approaches were used. Firstly, the follow-up questions were used as tools for maintaining consistency across the interviews. By using appropriate follow-up questions, the researcher made sure all interviewees talked about the same phenomenon (Åkerlind, 2005b). Secondly, Bowden's (2000)

and Trigwell's (2000) perspective was also considered as a complementary approach. They describe it as the interviewee's qualitative way of seeing the phenomenon that leads the interview process and forms its focus. Asking a combination of main questions and follow-up questions, every interview continued until the researcher was confident with the descriptions and meanings of the relevant terms (Trigwell, 2000). This was the time she made sure that the descriptions were full and accurate, and meanings were clearly expressed.

During all the interviews, the researcher was aware that in spite of the helpful feature of repeated follow-up questions for her, these type of questions might cause an uncomfortable atmosphere for the interviewee. Åkerlind (2005b) associates this with the deep reflection the interviewees are asked to conduct on the phenomenon, which may not be in their domain of experience so far (i.e. in the external horizon mentioned above). However, the researcher took advantage of some useful strategies to ensure that the interviews were conducted with a natural and conversational flow. This part is more related to the researcher's role, which is discussed in the next section.

- The Role of the Researcher

During the interviews the researcher encouraged the interviewees to talk about their experiences. Although the researcher needed to be silent most of the time, there were issues related to her role that needed to be considered.

As mentioned above, there were strategies that the researcher needed to apply for making sure that the interviewees felt confident during the interviews. Conducting the interview in a comfortable and friendly manner and in an informal place such as a coffee shop or a place familiar to the interviewee such as the interviewee's office was the usual approach for the face to face interviews. For Skype interviews, the interviewees were all at their homes, which provided an even more relaxed environment for them. The interviews all started with assuring the interviewees about the confidentiality of their comments. Other useful tactics were expressing the questions in alternative ways, and skipping some questions and returning to them at a later time in the interview, if needed. To be an effective interviewer, the researcher also tried to act as an active and good listener, and adopt a receptive perspective. According to Barnard et al. (1999), such conditions assure

the researcher that she is “fostering a liberal interview structure, a relaxed interpersonal relationship, and a feeling of individual freedom” (1999, p. 222). It, in return, let the interviewee feel more at ease and trust the interviewer. As a result, the interviewees were encouraged to reveal more aspects of their experiences, feelings, beliefs and understanding of the phenomenon.

Similar to other phenomenographic studies, the role of the researcher in the interviews had two aspects. The researcher tried her best to maintain a tenuous balance between these. On one hand, she strove to not let her ideas lead the interviewees’ thoughts; and on the other hand, she strove to maintain the focus of the interviews on the phenomenon in question. The practical form of this balance, through two complementary approaches of using main and follow-up questions is elaborated below.

As has been already mentioned, the primary goal of phenomenography is presenting the interviewees’ own points of view (second-order perspective) rather than the researcher’s. For this purpose, the researcher was required to bracket her preconceived ideas and knowledge (Ashworth & Lucas, 2000). That is, the researcher consciously avoided any sort of attempt to lead the interviewees’ thoughts and explanations during the interviews, especially with new words, phrases or concepts (Trigwell, 2000). Therefore, she remained silent during most of the interviews and receded from the interview flow. This enabled only the interviewees’ experiences to be reflected, which is the primary goal in phenomenography.

In general, bracketing is associated with, and derived from, the essential approach of the second-order perspective in phenomenography. That is, the phenomenographer brackets his or her own understanding to allow a second-order perspective to be highlighted (Figure 3-4). In other words, for achieving a second-order perspective towards a phenomenon (which is the primary goal of phenomenography), bracketing is required. This relationship is shown in Figure 3-4.

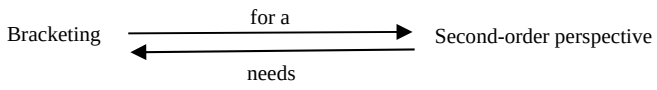

Figure 3-4 The relationship between bracketing and second-order perspective

However, in some situations, the researcher allowed herself to use her experience of the phenomenon. This happened when an illumination was required for clarifying what the interviewees said about their experiences of the phenomenon (Marton & Booth, 1997). Thus, the researcher was able to maintain the focus of the interviewees on the phenomenon in question. In addition, the researcher was careful to ensure that the interviewees understood the importance of simply providing descriptions of the phenomenon, rather than explanations of how and why the phenomenon was experienced in a particular way. This was done by using the follow-up questions which were described earlier.

Having conducted all the interviews, the researcher's next task was to transcribe the audio files of the interviews verbatim. The researcher transcribed all the interviews herself using Express Scribe software. Transcribing all the interviews by herself let the researcher familiarise herself more with the data set. The researcher prepared the transcriptions with every small detail, as presented by the interviewees. In this way, the researcher became capable of presenting "every minor linguistic or emotional aspect" (Åkerlind, 2005b, p. 116) within the interviews. Not being a native English language speaker, the researcher believed that having these linguistic and emotional aspects transcribed would help prevent her from taking the incorrect meaning of the words or phrases. From a slightly different perspective, the researcher was also cautious about her accent not causing the interviewees to misinterpret her. Therefore, at all the times during the interviews she spoke very slowly and clearly.

The transcripts then were printed and used for the purpose of analysis, which is described in the next section.

3-5-2 Data Analysis

After transcribing all interviews, the next step was analysing the data. Data analysis is a process with a "contextual analytic and an interpretative character" (Svensson, 1997, p. 169). Similar to other phenomenographic studies, the main phase of analysis began after all interviews had been conducted. Taking such an approach, the possibility for introducing new meanings and content in the interview session by the interviewer decreased to a great extent. As a result, the later interviews are not influenced and altered (Bowden, 2005). Moreover, such practice

assists the researcher to consider all the research material as a whole, which will be discussed in detail later in this section. However, following a common belief in phenomenography, the first step in analysis launched during the interviews, in which variation in the experiences of participants was being probed. It was through preliminary analysis that the interviewer was enabled to recognise that no new variation was being introduced by the participants and that the data collection had met saturation point. The researcher acknowledges here that she might have been influenced in subsequent interviews by listening to the previous interviews and starting to see different ways of experiencing. However, she did her best to stand back from making any decision until she was deeply immersed in the data set through reading all the transcripts.

A primary feature of phenomenography is that data analysis is about categorising the content of *what* has been said in the interviews (Svensson, 1997) instead of *who* has said it. This is why it has been argued that in the phenomenographic data analysis process, the nature and characteristics of the data are transformed. That is, the data which is derived from individuals' way(s) of experiencing the phenomenon is replaced with a collective view of all ways of experiencing. In other words, the basic unit of phenomenographic analysis is an individual experience (Marton & Pong, 2005) while the outcome shows a collective experience of the phenomenon being explored (Lupton, 2008). This feature points out the importance of differentiating between the content and the owner of the content (in this case, web professionals). That is, for analysing the data, the researcher aimed at grouping similar experiences of the phenomenon, which were found in different transcripts rather than grouping similar transcripts. Therefore, the analysis was done across the group, and not individual by individual. This was how the researcher sought to gain a collective description of variation in meaning and not in people (Marton, 1994). However, it should be noted that for reporting the results individuals' quotations were used to make the descriptions of different ways of experiencing the phenomenon clearer and more explicit (Lupton, 2008). In reporting the outcome of the study, extracting relevant parts of interview transcripts helped to present a frank and clear expression, description and understanding of the nature of each experience. In using the quotes, the researcher tried to select parts that were a

"representative, convincing and parsimonious" (Åkerlind, 2005b, p.124) representation of their related categories.

Following another principle of phenomenographic analysis, the researcher was circumspect to emphasise only the "content of description" and not on the "language used" (Barnard, et al., 1999, p. 223). That is, the researcher had to base the analysis of the transcripts on the linguistic meaning of the words, and not on the expressed content (Svensson, 1997). Therefore, the researcher was expecting expression of the same experience in different forms, and vice-versa, a variety of expressed meanings using similar language. Therefore, the analysis of the data in this research was not a type of keyword analysis, but a meaning analysis.

When reading the data set, a specific experience did not have to be mentioned by all participants for it to be considered as suitable for inclusion in the analysis. This means that as soon as a qualitatively different way of experiencing the phenomenon was detected in the data, it entered into the pool of experiences. Thus, the number of times a way of experiencing appeared in the data set was irrelevant in analysis. In fact, it was the differences that were important to the researcher. All identified experiences received equal weight in terms of importance, regardless of the number of times they had been expressed by the participants (Huntly, 2003; Marton & Pong, 2005). Assigning equal value to all descriptions and ways of experiencing is called "horizontalization", one rule in phenomenographic data analysis applied by Barnard et al. (1999, p. 223) and even earlier by Ihde (1986) and Sandberg (1994). In contrast, there were also cases in which an individual had expressed more than one way of experiencing the phenomenon.

As in the data collection phase, "bracketing" was an important feature in the data analysis phase. Bracketing is one principle in phenomenographic analysis, which has been considered as commonly in practice. The researcher in this study was very careful to put her preconceived ideas about what might be discovered during the process aside. Instead, she simply interpreted the content of what was said by the interviewees. This means that the researcher's own way(s) of experiencing the phenomenon was not included in the collected research material, unless it was mentioned by one of the participants (Barnard, et al., 1999; Bowden, 2005).

To assure bracketing, the researcher used the methodological technique of applying empathy (Ashworth & Lucas, 2000). Empathy refers to "imaginative engagement" with the interviewees' world, as described by them (p. 299). This approach, however, did not mean that the researcher's point of view should not come into play when categorising the data and investigating the relationship of and structure between the categories. In fact, it was the researcher who drove the analysis at the time of investigating the outcome space of the phenomenon (Bowden, 2005). Moreover, the researcher's perspective was an influencing factor on the descriptions developed, besides the empirical and theoretical context of the research (Svensson, 1997). Therefore, the researcher acknowledges her major role in constructing the categories and defining them in terms of meaning, focus and structural aspects. Consequently, in the explicit discernment between the two approaches of positivist-objectivist (in which categories are there in data waiting to emerge) and interpretivist-subjectivist (in which researcher imposes his or her assumption on data and manipulates data) mentioned by Lupton (2008), the current research adopts the latter one. In such an approach, the researcher constitutes the categories of description through interpreting the data (Sandberg, 1997), but without imposing her views. Researcher's subjectivity is considered in more detailed at the end of this chapter when discussing the trustworthiness of the research. However, it is emphasised here that in spite of the fact that the analysis and consequent description is informed by the researchers' experience, the evidence base for analysis is still the participants' experiences.

Bracketing and the way it was followed in the analysis phase in the present study will be considered again at the end of this chapter, when justifying the interpretive awareness maintained in the research. The next section describes the actual practice of data analysis in the current study. This is based on the notes that the researcher recorded during the long iterative process of analysing the data.

3-5-3 Data Analysis in this Research

All phenomenographers base their analysis on differentiating and identifying the structures among the variation that emerged (Svensson, 1997). This is the main approach but can be implemented in slightly different ways (Åkerlind, 2005c;

Barnard, et al., 1999). The current study followed the approach taken by Marton (1986), the founder of the methodology.

Briefly, the data analysis in the current phenomenographic research was in the form of an iterative content analysis process concentrating on the whole body of transcriptions. This included:

- reading the transcripts;
- discerning expressed experiences of the phenomenon under investigation by participants;
- grouping the experiences based on their similarities and differences to form categories of description;
- identifying the structural relationships between the categories of description (Åkerlind, 2005b).

The analysis started with reading and rereading the transcripts. Although the transcripts were read individually, since the main focus was on gaining a collective understanding rather that individual understanding, the whole set of transcripts was considered as a united body (Åkerlind, 2005c). However, preliminary consideration of and comparison between 23 interview transcripts was a challenging task in terms of managing the data. This challenge was also mentioned by Åkerlind (2005a) as one of the first analysis issues for phenomenographers that is approached in different ways (Åkerlind, 2005c). Similar to other phenomenographic studies, an iterative approach was applied to view the data several times and in different levels of detail. Moreover, the sequence of identifying the referential and structural aspects are approached differently by different researchers (Åkerlind, 2005b). As will be seen shortly, in the current study, these two phases were conducted separately. The structural aspect of the phenomenon under investigation was studied only after all four categories of description and their meanings were revealed. However, it should be acknowledged that in distinguishing the groups, the distinctive features of each group in relation to other groups were constantly in view. Therefore, the referential and structural aspects are still understood to be related and intertwined.

The first two major rounds of reading were implemented with the aim of familiarisation with the data. During this time, the researcher needed to keep her

mind open and endeavour to prevent any predeterminations about different experiences of the phenomenon under study. Then, after reading each transcript three to four times, the researcher wrote a one-page reflection about each transcript. This reflective writing included the core obvious ways of experiencing the phenomenon within each interview. For writing this reflective document, the researcher asked and responded to the key question: "What is effective use of information in this interview?" These one-page reflective documents played an important role in helping the researcher to familiarise herself with the possible existing core experiences in the whole available data.

After gaining an overview of the data, the researcher started the second round of reading. The difference between this phase of reading and the previous phase was in the level of attention to detail. At this stage, the researcher began to read and compare a group of four to five transcripts together, but in a more precise way. Selection of transcripts in each group was based on the overall view of each participant towards the phenomenon, which was mainly gained from the associated one-page reflective documents. In order to do this, interview transcripts that generally demonstrated significant differences in experience were grouped together. This approach ensured that as much variation as possible was being considered in these small groups. For this purpose, the researcher sought layered experiences and took note of them. This step also helped her to broaden her perspective of the existing experiences. In this phase, again, the researcher read the transcripts with the aim of answering one question: "What is effective use of information in this interview?" At the end of this stage, more specific ways of experiencing had been revealed.

After the two phases of familiarisation, the researcher began to generate pools of similar experiences. In order to be more organised and systematic in managing the pools of experiences, she took advantage of qualitative data analysis software: NVivo. Reading each transcript at a very detailed level, she tried to identify parts of the transcript that answered the question: "What is effective use of information in here?" With every new way of experiencing, the researcher created a "node" in the software. In NVivo, nodes are used to classify a collection of references that are about a theme. In the case of this study, experiences were considered as themes. Therefore, for each specific experience, one node was defined and all the quotes

(references) related to that experience were imported under that particular node. For instance, one of the identified preliminary experiences was “building a website that works”. The first time that this experience was identified, a node with that name was created and the first quote was imported into that node. Then, every time a similar experience was observed, that quote was imported to that node. This was done for all the 23 interviews. The result was 34 nodes with relevant quotes in each node. In the process of assigning parts of the interviews to different nodes, there were situations when the researcher was doubtful about the right node for that experience. Therefore, she assigned it to different nodes to make sure it would be reviewed at later stages. Moreover, it is recalled here that in collecting related references under a theme, only the meaning of the references, and not the language used, was considered.

It should be acknowledged here that although the ultimate aim of phenomenography is uncovering the critical qualitative variation between ways of experiencing a phenomenon, at this stage the researcher was seeking for every minor variation. This approach was taken in order to make sure that variation in a detailed sense had been considered. The outcome of such an approach was the generation of many nodes that, in comparison with the general created nodes, were similar rather than different to each other. For instance, the nodes such as “building a website for users” and “building the website for all” were similar to the prior mentioned node: “building a website that works”.

Having identified every detailed experience and assigned it to a node, the analysis entered into its next phase. At this stage, each node, which was a collection of quotes, was printed separately. In this printed collection of quotes, each quote was presented in a single paragraph. As all these quotes belonged to one node, it was expected that all of them would convey the same experience. However, to confirm this, the quotes in each printout were read again. This round of reading revealed that some of the quotes did not really convey the same experience as the rest in the group. Therefore, they needed to be removed or moved to another group. For this purpose, the researcher cut and separated quotes in the print-outs. Every separated quote at this stage received a post-it note with their reviewed experience and the interview number written on it. Based on the similarity between the new experiences, the quotes were regrouped and attached again by paper clips.

As can be seen, in this research the uncovered experiences were detached from their original context (i.e. interview transcripts). According to Marton (1986), this gave two contexts for interpreting the excerpted quotes: the interview context from which the quotes were coming and the pool of experiences, which included different groups of experiences. However, since in the middle of the analysis process the main analysis environment shifted to the pool of experiences, the inclusion of the interview context might be questioned. The researcher emphasises again that conducting two major rounds of reading gave her a good overview of each interview and its available data. Therefore, it is claimed that although she mainly worked on the pool of experiences, she was also able to keep the interview context in her consciousness. Having read each interview transcript very well and in detail at the beginning of the analysis process, she was able to refer to the exact location of a particular quote within the associated transcript without any difficulty or confusion. Therefore, in cases when she needed to check the broader context of a quote, she easily returned to the origin of the quote.

As was mentioned above, the uncovered experiences at the previous stage were not all qualitatively different from each other. That is, some level of similarity was observed among a number of them. In the next step of analysis, therefore, the researcher started to group similar experiences and their associated quotes, to form more general experiences. For instance, all the three mentioned groups of quotes under the experiences of “building a website for users”, “building the website for all” and “building a website that works” were gathered together to form the broader experience of “building a successful website”. This process was then conducted across all the groups. During the process and due to more detailed interpretation, several single quotes again moved across the groups, and several were eliminated from the pool of experiences. The outcome of this stage was 13 groups that were quite different from each other. Therefore, these groups were eventually considered to be pre-categories of description. For each pre-category of description, a meaning and a focus of attention was sought. This again revealed a certain degree of similarity between the meaning and focal point of some of these pre-categories of description. This lead to merging more pre-categories of description together. This was done in consultation with the supervisors. The eventual outcome was six categories of description:

1. Building a successful website
2. Solving a problem
3. Keeping informed
4. Using best practices
5. Using information resources
6. Being part of a learning community of practice

Having identified six categories of description, along with the meaning and point of focus of each category, the researcher then wrote about the background and margin of each category. This gave a clearer image of each category, its referential and structural aspects. As a result, it was observed that two of the identified categories (Categories 4 and 5) were not actual categories of description, but one aspect of the existing categories (Categories 6 and 2, respectively). Therefore, these two categories were inserted into their relevant categories, to form the final four categories of description of the phenomenon of information literacy experienced by web professionals. It was also at this stage that sub-categories for each category were identified, as a result of more detailed analysis. The sub-categories were different aspects of the core meaning of each category. These aspects were more similar rather than critically different to stand alone as a separate meaning and therefore, as a separate category of description. The four main categories and their sub-categories are as follows:

1. Building a successful website
    a) Making the client happy
    b) Making users satisfied
    c) Building a seamless website
2. Solving a problem
3. Staying informed
    a) Keeping current
    b) Building a knowledge base
4. Participating in a community of practice
    a) Taking information
    b) Giving information

Having constructed the final categories of description of the phenomenon, another phase of analysis launched for confirming the internal structure of awareness of each category. This phase also sought the aim of identifying the common aspects of all four categories and their features in each category. This, as was touched on previously, revealed the dimensions of variation of the experience of the

phenomenon of information literacy, which will be discussed in more detail in Chapter 4.

Finally, the last phase of the analysis was identifying the relationships across the categories of description, in order to form the outcome space of the phenomenon. In order to do this, the researcher created a table in which all categories of description and their sub-categories, along with different elements in their structure of awareness and their dimensions of variation, were located in different rows (Table 4-5 in Chapter 4). Up to that point, since seeking the relationship between the categories of description was not a primary focus, no order was set for considering the categories of description. That is, all categories were being considered individually. Therefore, the order in which the categories were sitting in the table was not based on any relationship between them. However, having an overview of all the findings in one table, the researcher was enabled to identify the relationships across the categories and between their components. This relationship dictated the order of placing the categories of description in Table 4-5, as well as the order of discussing the categories of description in Chapter 4. The outcome space of the phenomenon of information literacy for web professionals then was formed, based on considering these identified relationships.

3-6 Justifying "Trustworthiness": Research Validity and Reliability

The different nature of the interpretive approach within phenomenography in comparison to traditional positivistic approaches poses a different set of criteria for measuring the value of this type of research. Sandberg (2005) noted that since interpretive and positivistic research approaches have very different theoretical and methodological principles, applying the same criteria for justifying the knowledge produced from each of these approaches is inapplicable as well as inappropriate. In fact, in Sandberg's view, justification of the knowledge produced from an interpretive approach is only possible by referring to the ontological and epistemological assumptions, which form the basis for the interpretive research approach. Moreover, Prosser (2000) states that a researcher's precise reflection on their process of research helps to justify the validity and reliability of the research.

The terms "reliability" and "validity" in the current phenomenographic study are, therefore, conceived differently in comparison to reliability and validity in

positivistic research. Validity in the interpretive approach is concerned about the trustworthiness of interpretations while reliability checks how the trustworthy interpretation is gained (Sandberg, 2005).

For the purpose of justifying the validity and reliability of this interpretive research, two frameworks have been used. The framework underpinning validity in the current study is based upon a combination of non-conflicting attitudes proposed by Booth (1992) and Sandberg (2005). The interpretative awareness framework from Sandberg (1997) then addresses the question of reliability. Sandberg (1997) suggested that interpretive awareness is a more appropriate criterion than replicability for establishing reliability.

3-6-1 Validity: Trustworthiness of Interpretation

For justifying the credibility of knowledge claims of phenomenographic research, it is necessary to consider the whole process from the way it has been designed and conducted to the way the outcome is presented. According to Booth's (1992) framework, three aspects of validity are of importance: "content related, methodological and communicative validity" (p. 65). Sandberg (2005) also presents his framework from three aspects of "communicative, pragmatic and transgressive validity" (p. 54). A combination of these two frameworks will provide a more holistic view and a more comprehensive framework for justifying validity. Therefore, for a practical framework that is usable through different phases of the research process, Booth's (1992) and Sandberg's (2005, p. 54) frameworks are used to shape a combined reformatted framework, which considers validity in these three phases: data collection-related validity, data analysis-related validity and result presentation-related validity. This will help the researcher to demonstrate a clear justification of each phase of the research.

As this new reformatted framework has drawn on two differently structured frameworks, when citing those two frameworks, the relevant section in them is also referenced (i.e. content related, methodological, and communicative validity in Booth's (p. 65) framework and communicative, pragmatic, and transgressive validity in Sandberg (p. 54)).

3-6-1-1 Data Collection-Related Validity

Data collection-related validity is concerned with how the data collection is conducted. This includes considerations of the researcher's content knowledge, sampling, research participants' perspectives towards the context of the study and the data collection process.

The researcher's content knowledge is a precondition to the data collection-related validity. Since the research topic plays a significant role in each study, the researcher needs first to have a deep understanding of the subject content. This familiarity, however, should be used openly to let the researcher behave in a receptive manner about unique ways of seeing the phenomenon under investigation (content-related validity, Booth, 1992). The researcher in this study took advantage of her understanding of the website design and development field, which was gained from her previous work experience as a web librarian. Her extensive studies in LIS field had also equipped her with an understanding of the information literacy concept, which together enabled her to justify the validity of this phase of the research process.

The importance of having the second order perspective (i.e. the interviewees' perspective) in phenomenographic studies requires a careful consideration of the research population and the sampling technique. The researcher needs to ensure that the chosen population and subsequently the selected sample involve the most relevant participants for invitation to the interviews (Methodological validity, Booth, 1992). Sandberg (2005) discussed this issue in terms of transgressive validity. To achieve the goal of phenomenography which is an investigation of variation in experiences, the researcher must not ignore the "ambiguity, complexity and multiplicity in the lived experience investigated" (p. 57). This might happen as a result of an effort to highlight the consistent and coherent ways of seeing the phenomenon in question, in order to identify the categories of description. A requirement, for example, for ensuring this type of validity in the data collection phase is including women as well as men to ensure that a female imaginary is embedded in the outcome space. Among the 25 participants of this research, 13 participants were male and 12 participants were female in order to include the female perspective. Moreover, taking advantage of snowball sampling in which it was very

likely that each interviewee introduced another relevant interviewee assisted the researcher to ensure the validity of this phase of the study.

The researcher starts data collection with forming an understanding between himself or herself and the participants. This may include discussing the purpose of the study with them. The researcher should make sure that context has been defined for the interviewee as clearly as possible. A deep understanding of the research purpose and interview context on the part of the research participants increases the depth of the interviews. This, in turn, will result in a rich description encompassing valuable content from which the analysis forms (Methodological validity, Booth, 1992; Communicative validity, initial phase, Sandberg, 2005). In the case of this study, the researcher sent an information sheet, containing information about the research topic, its goals and interview questions to the participants. In this way, the participants had time to think about the questions. According to Sandberg (2005), a conversational interview format allows for the generation of a fruitful and verbal description of the phenomenon under investigation. Following this approach, the researcher formulated only a few main research questions followed by different prompt questions. In this way, she was able to keep focused on the interviewee's experiences.

Sandberg (2005) further discussed that there is always possibility that the interviewee will distort the way they experience a phenomenon. That is, their description of how they do a thing may be inconsistent with how they actually do it. This issue, which Sandberg (2005) believed to be a concern for pragmatic validity, may be solved by asking follow-up questions that ask interviewees to describe concrete situations in support of their perspectives. His other solution was checking the interviewees' reactions to deliberate mispresentation or misinterpretation of a statement. This normally causes clarification from the interviewee's side. A third way to validate the data in terms of pragmatic consistency is using observation. In fact, it is important for the researcher to be aware that in the case of using observation as a means of controlling data collection validity, he or she is using a second type of data collection tool to assist her in achieving more data. As was mentioned earlier, for the present study, in addition to the main interview questions, follow up questions were asked where more reflection upon the interviewee's experience of the phenomenon was required or an area of discourse needed

clarification. Moreover, on some occasions, in line with the purpose of confirming the exact understanding of the interviewee, the researcher deliberately misinterpreted a statement. This strategy caused the interviewees to reflect more deeply and more clearly on their experiences, which resulted in richer data. The researcher also let the interviewees know that they were welcome to refer to websites of their choice, if it helped them to talk about their experiences. However, only one of the participants followed this approach.

The researcher also needs to have and simultaneously be aware of his or her "reflexive attitude" (Methodological validity, Booth, 1992, p. 66) to be able to switch focus between the progressing interview and forming research material stemming from that interview.

3-6-1-2 Data Analysis-Related Validity

The validity of the phenomenographic data analysis is mainly demonstrated by engaging in bracketing which was discussed earlier. For ensuring validity in this phase of the research and according to the methodological validity introduced by Booth (1992), the researcher in this study did her best to keep her mind open to all ways of experiencing the phenomenon that were identified as the research proceeded. She also made sure that she only looked for the meaning in the material produced in the interviews.

Based on Sandberg's (2005) framework, looking for interpretive coherence is a way of validating the data analysis process. The coherent interpretation which Sandberg based on Palmer's (1969) "hermeneutic circle" is achieved by a circular search between parts and whole. In practical terms, this means that in forming an understanding of a text, the researcher needs to read parts of the text separately as well as simultaneously considering the text as a whole. Therefore, the researcher needs to constitute a coherent interpretation by using statements that are consistent with the statements in the same context as well as the whole transcript. This occurs at a single interview level. In the next step, there will be a categorization, which places similar interpretations in the same group. Comparison inside and between categories continues till coherence is refined to a desirable level (Communicative validity, second phase, 2005). Sandberg (2005, p. 58) further drew on Lather's (1993) work to suggest that looking for "differences and contradictions" instead of "coherence"

might be useful in validating data analysis. In this way, the researcher is able to formulate the interpretations in a well-defined, accurate and explicit way. He also mentioned taking advantage of using "irony" for extracting potential hidden interpretations that might have been ignored due to focusing on existing interpretations (Transgressive validity, 2005). Writing a one-page reflection about each interview to start analysis, which was discussed earlier, was in line with following this strategy (i.e. looking for interpretive coherent). In doing so, although a holistic view was being maintained towards the interview transcripts, they were being considered separately. In addition, in a more detailed level, printing out each expressed experience, re-assessing the meanings of different experiences based on alternative perspective(s) and comparing them together based on the similarities and differences among them was conducted to ensured data-analysis validity.

3-6-1-3 Result Presentation-Related Validity

As with data collection and data analysis, the presentation of results is of great importance in the trustworthiness of the research process. Therefore, validating this part of the research journey is necessary as well.

As said before, the result of a phenomenographic research is shown in the form of an outcome space including a number of categories of description and the relationships between them. A clear, detailed and explicit description of categories of description and the outcome space establishes the validity of phenomenographic results, because it can be scrutinised rigorously by researchers in that area of interest (Methodological validity, Booth, 1992).

The outcome of phenomenographic research is considered from the perspective of communicative validity as well (Booth, 1992; Sandberg, 2005). The researcher is required to assure that the categories of description and the resultant outcome space are communicable for the researchers and practitioners acting in that particular area of research. The people living in the world from which the phenomenon was selected should be able to recognise their world and the different meanings identified in the study. In fact, as the world in which we live is constituted intersubjectively, the researchers and practitioners from the same area, the reviewers and editors who conduct the review process of published results, as well as gatekeepers who formally assess the quality of the discipline's publications have a significant impact on the

presented results (Communicative validity, third phase, Sandberg, 2005). Therefore, it is critically important that the results are sufficiently communicable to be accessed by them. To date, the outcome of the pilot study has been published as one journal article. Preliminary findings from the pilot study were also presented in conferences in 2012 and 2013, both of which were to do with Library and Information Science. The results and different sections of the research such as the applied methodology, data analysis techniques, or literature review were also presented in different units of a LIS course at QUT during the researcher's PhD journey. The positive feedback and relevant comments received from all these channels helped the researcher ensure that the process and outcome of the study made sense to different types of audiences.

Sandberg (Pragmatic validity, 2005) suggested another way to validate the results, which inevitably should be conducted after research finalization. In this way, the results are applied pragmatically in another study. The outcome of the two studies should confirm each other if the outcome of the first one has been recognised as valid. This can be planned for a future study. As will be seen in Chapter 5, a study investigating the phenomenon in a more specific population could also be a good context for validating the present study pragmatically.

As shown above, the major goal in validating the results of the interpretive research is to justify the trustworthiness of the interpretation. However, researchers also need to justify the process of producing those truthful interpretations, which is discussed in the reliability section (Sandberg, 2005).

3-6-2 Interpretive Awareness: An Equivalent for Reliability

The reliability of results in quantitative science research is measured mostly via replicability. However, phenomenographic results cannot use replicability as a criterion for reliability. Phenomenographic results are constructed as a result of the researcher's interpretation. Therefore, since by nature interpretation is not replicable, phenomenographic results are not replicable either (Sandberg, 1997). In other words, it is probable that two researchers would come to two different sets of categories of description as a result of investigating one particular phenomenon. This difference in the outcome could be based on the different ways of interpreting the data gained about that phenomenon. This makes the replicability principle inappropriate for this approach (Säljö, 1988).

Even inter-judge reliability, one test of replicability, in which another researcher reads the transcripts to verify the categories of description, has not been an appropriate solution to the question of reliability in phenomenography, due to its objectivistic epistemological basis. This means that the main problem with this approach is that it neglects "the researcher's intentional relation to the individuals' experiences of reality" (Sandberg, 1997, p. 208). This results in not taking into account the researchers' data analysis procedure. In fact, it does not clarify to what extent the researcher has been faithful to the data.

Demonstrating "interpretative awareness", as proposed by Sandberg, is an alternative criterion for showing the reliability of phenomenographic results and this was followed in the current study (Sandberg, 1997). Through establishing interpretative awareness, a phenomenographer is able to demonstrate their faithfulness to the data, by addressing the ways they have "controlled and checked their interpretations throughout the research process" (p. 209). For the current study, as mentioned before, the researcher's subjectivity was acknowledged in all parts of the research process, including while formulating research questions, sampling, collecting data, and especially analysing the data and discussing the results. Sandberg (1997) placed this in line with Kvale's (1991) notion of "perspectival subjectivity" in which the researcher acknowledges their awareness of how their interpretations affect the research process and results. Based on Kvale (1991), the researcher also needs to acknowledge how particular disciplinary, theoretical and methodological perspectives influence the interpretations constituted. That is, in the case of the present study, in addition to researcher's subjectivity, her background in website design and development area was acknowledged to have a role in the way she framed her interpretations and the outcome of the study. Moreover, the researcher's deep understanding of phenomenography gained through the research journey lead her to frame a technique for analysing phenomenographic data that was directly applied to the way she approached the analysis. This is discussed in more detail in Chapter 5.

According to Sandberg (1997) and as mentioned earlier, taking advantage of phenomenological reduction (i.e. bracketing) would be a suitable way to maintain interpretative awareness during research. This implies five distinct steps.

For the first step, the researcher needs to be "oriented to the phenomenon as and how it happens" (p. 210). This can be done by formulating appropriate research questions as well as clarifying the research object. The researcher's background in LIS, and website design and development fields, along with the expertise of the research supervisory team, ensured clarity in the research object as well as the formulation of the research question addressed by the present study.

The second step would be to describe rather than explain. The researcher should be very careful of not surpassing the participants' expressed understanding of the phenomenon, as this might lead to explanation, which enters into supposition, going beyond the empirical data. In line with this approach, and as will be seen shortly in the findings chapter, the researcher's interpretation of the collected data is only in the form of description of what has been said in the interviews and therefore no explanation is provided for participants' statements.

In the third step, all aspects of the interviewees' experiences are being considered as equally important. This is an issue to be considered both during the interviews and the analysis process. In order to follow this step in bracketing, the researcher made sure that she treated all the expressed experiences and their associated aspects as equally important. As a result, no matter how frequently a way of experiencing was raised by research participants, they were all treated equally important.

The fourth step requires the researcher to seek the "basic meaning structure" which is done through "free imaginative variation" in phenomenology (p. 210). Following this principle, the stability of the initial interpretation must be controlled and assured via adopting different interpretations while reading and rereading the transcripts. Assessing the stability of interpretation started with the main phase of analysis. As was mentioned earlier, the analysis started with seeking every minor variation. This generated too many preliminary departure points for checking the stability of the interpretation during the process. This assessment phase then lasted until the four final categories of description were confirmed by the researcher and the supervisory team, and further analysis indicated no more variation.

Finally, to present a more developed image of the qualitatively different ways of seeing the phenomenon, the researcher should use "intentionality as a

correlational rule" (p. 210). Through three steps in this final stage, the "what" and "how" of the participants' experiences of the phenomenon and the way they are related together are identified. This is what was followed in the analysis process of the current study. In line with the mentioned principle, the analysis endeavoured to identify participants' experiences of the phenomenon and ways of experiencing the phenomenon. It also included a further step when the relationships between identified ways were considered.

3-7 Conclusion

This chapter outlined the interpretivist paradigm as the informing methodology for the research presented here. The chapter also highlighted the important features of a phenomenographic study and introduced the different parts of the outcome it produces. This was followed by presenting an overview of the design of the research and considerations for ensuring research rigour. The next chapter articulates the findings of this research. This is a presentation of four categories of description related to each other, to create the outcome space of the phenomenon of information literacy from the viewpoint of web professionals.

Chapter 4: Findings

4-1 Introduction

This chapter presents the findings of the research. As the result of a phenomenographic study, the findings are a report of variation in experiences of information literacy among web professionals. However, as was mentioned at the beginning of this thesis, due to the very specific level of discussion in this chapter, the equivalent term of "effective use of information" has been applied here. This variation is represented through four categories of description and an outcome space. Following an overview of the categories of description and their different sections, each category is discussed separately in detail. Then a discussion about the outcome space of the phenomenon is presented, which indicates the relationships between the four categories of description.

4-2 An Overview of the Categories of Description

The analysis of the data revealed that the variation in experiencing effective use of information by web professionals may be presented through four categories of description. These are:

1. Staying Informed
2. Building a Successful Website
3. Problem Solving
4. Participating in a Community of Practice

These categories are qualitatively different from each other, based on the focal point of awareness in the experience of which they are representative. Three of the four main categories have sub-categories, since their focal point of awareness includes some variant aspects. These sub-categories have the primary focus of the main category, but have a secondary focus on their own. The sub-categories are as follows:

1. Staying Informed
    a. Keeping current

    b. Building a knowledge base
2. Building a Successful Website
    a. Making the client happy
    b. Making users satisfied
    c. Building a seamless website
3. Problem Solving
4. Participating in a Community of Practice
    a. Information giving
    b. Information taking

Three different aspects of each category are described below: the meaning of the category (referential aspect), the structure of awareness of participants in that category (structural aspect), and dimensions of variation within that category.

Meaning: The description of each category begins with a meaning statement that depicts the essence of the experience of the phenomenon in that category (and sub-categories, where applicable). This is the referential aspect of the phenomenon for each category. Starting with "Effective use of information is experienced as ...", this statement talks about the exact meaning of the experience. An indicative quote extracted from one of the interviews follows the meaning statement, to make it more tangible. The relevant interview number is shown in brackets.

Structure of Awareness: The next major section discussed in the categories of description is the structure of awareness of participants in each category, which includes the focus of awareness, the background of awareness and the margin of awareness. The focus of awareness is the distinguishing feature of each way of experiencing the phenomenon. This is an element that participants maintain in their attention when talking about the experience. The immediate context surrounding the focal point of awareness constitutes the background of awareness. This area involves elements of which the individual is vaguely aware. In the case of this research, the elements in the background of awareness in many cases are quite related to the ones in the centre of awareness for that category. Beyond the background of awareness then comes the margin of awareness, that involves the elements towards which the participants show very little or no attention.

These three aspects are discussed separately for each category (and its sub-categories, where applicable). However, there are also exceptions, such as in Category 2, where the focus of awareness is only discussed for the sub-categories or in Category 4, where due to the similarity between the background and margin of awareness of the two sub-categories, these spaces are described together.

As will be discussed in the outcome space of the phenomenon at the end of this chapter, in many cases the elements in the background and margin of awareness of each category are observable in the focal points of awareness of the other three categories or their sub-categories. This observation from this study could be of use in future phenomenographic studies. This will be defended more in the Discussion chapter.

Similar to the meaning statement, when describing each zone of awareness, in some cases an illustrative quote is presented for further clarification.

Dimensions of Variation: The third major area described for the four categories of description is their dimensions of variation. Dimensions of variation are elements that exist in every category, but show distinct characteristics across the categories of description.

When describing their experience of the phenomenon under investigation (i.e. effective use of information), regardless of what that experience is, all participants covered the experiences of two common elements in their interviews. However, these elements were seen differently across all or some of the categories and their sub-categories. These two elements (or dimensions of variation, hereafter) are "information" and "information use".

"Information" was a key element for all participants when describing their experience of effective use of information. This is of no surprise since the subject of the current study is the relationship between web professionals and information. Web professionals in all categories experienced information as an informing source, however they experienced it quite differently within each category. Responses to the question of "What is information, for you?" ranged from "everything is information for me" to "I don't know! It's a very vague concept".

"Information use" is the second dimension of variation. It should be noted that the experience of "information use" as a dimension of variation is different from the

experience of "*effective* use of information" as the phenomenon under investigation (i.e. information literacy). In fact, when talking about information use, only the act of using information is important, regardless of the outcome or the effectiveness of this act. Meanwhile, if web professionals' endeavour in this act successfully results in a desired outcome, this effort is considered as "*effective* use of information". That is, the experience of information use is only one aspect of the experience of effective use of information.

Interestingly, for the dimension of variation of information use, a feature of continuity was recognised and this is discussed separately for each category (and its sub-categories, where applicable). This feature is basically about the length of the information use experience.

The next section discusses the meaning, structure of awareness and dimensions of variation of each category in detail. A table at the end of each category of description summarises the category, in order to provide a more accessible view.

The order in which the four categories of description are presented is related to the level of engagement of web professionals with the community of practice. This will be discussed in detail at the end of this chapter when describing the outcome space of the phenomenon of effective use of information.

It is also acknowledged here that although the research sample from which the data was collected contained a similar number of designers and developers, the data happened to highlight the development aspect more than the design aspect. This occurred even though the researcher acknowledges that she considers both to contribute to building websites.

4-3 Categories of Description

Category 1: Staying Informed

Meaning

For Category 1: Staying informed, effective use of information is experienced as scanning the information environment and storing the useful parts of it in a knowledge base for potential future use. In this category, effective use of information occurs at two different stages. At the first stage, web professionals explore the information environment and at the second stage they capture parts of this information environment that they find potentially useful and organise it into a knowledge base. As a result of effective use of information in this specific way, web professionals on one hand are always up to date with what information is available to them and what is occurring in the environment around them and on the other hand are able to retrieve useful stored parts of that environment when needed. Scanning the information environment and storing useful information are considered to be two phases of the experience and as a result, two different sub-meanings of the general meaning of staying informed and are discussed as sub-categories of Category 1. The quote below is a good example, showing these two meanings together:

> I think in terms of … using information effectively, it's about knowing what is out there; not specifically how it's done; but how it can be done and who has done before and way to find information if you need some time. You develop this catalogue in your brain; knowing of what sort of techniques people use and knowing where it is (Int. 4).

Focus

Being information-aware for encountering future information-required situations is the central feature of the general experience of staying informed. In other words, the main focus of this category is being informationally vigilant and equipped. In describing this experience, web professionals were mainly concerned about knowing what information was available for them and capturing it, in some cases.

> I just want to know what's going on. Just to keep it (Int. 4).

As mentioned previously, the main focus of awareness in this category includes two different phases that lead to constitution of two sub-categories: 1) Keeping Current, and 2) Building a Knowledge Base. These sub-categories are described below in terms of their referential aspect and structural aspect.

Sub-category 1-A: Keeping Current

Meaning:

Regarding Sub-category 1-A: Keeping current, effective use of information is experienced as scanning the information environment in order to stay informed, updated and skilled, to move with advancements in the industry and to not be surpassed by others. Web professionals in this sub-category believe that the information environment of the web industry is very dynamic. Therefore, they see it is imperative to constantly integrate with new stuff and keep pace with emerging movements and changes within the industry. Otherwise, they see themselves as being surpassed by other practitioners in the field. For example, one participant explained how he kept current in the following ways:

> I follow information management groups or information architects. I'm just feeding. It's not quite a static thing. It's constant reading and knowing what's happening out there. It's a mash-up of all these ideas that are floating around (Int. 23).

Structure of Awareness

Focus: The distinguishing feature of web professionals' awareness in this sub-category is keeping aware of current information trends in the field. What is most important in this category is becoming aware of what is happening in the information environment and maintaining this state of being informed. For instance, the participant below saw this as imperative if he wanted to stay in the Web industry as a professional:

> If I become a professional website developer where I would deal with such things in everyday life, in everyday projects day by day, then it could probably be better for me to actually let go in and indulge into the new stuff that is around now (Int. 4).

Keeping current is not only associated with the web professionals' knowledge, but also with a specific website's status. To make a website work properly, web professionals have to keep themselves informed about its status. One participant likened this need to running a domestic appliance:

> Just like the fridge. You have to keep the power on; otherwise it stops working (Int. 8).

Background: There are three background aspects in this sub-category: knowledge base, problem solving and users. In this category, there are indications that web professionals may recall information that they have experienced once before in their keeping-current activities. This shows that they may unconsciously form a knowledge base in their mind and

use it or develop it during their keeping-current activities. Therefore, it could be concluded that although not clearly mentioned, they are aware of the value of forming a knowledge base. However, it seems that this is not their primary concern when they talk about the value of keeping themselves informed and therefore awareness of a knowledge base is located in the background of their structure of awareness. Moreover, as the secondary incentive in this experience is preparation for encountering future potential information-problematic situations, it could be said that the element of problem solving, although not in the focal point of their awareness, exists in the background of their awareness.

A third feature in the background of web professionals' awareness of keeping current is a consideration for users' changing preferences. As will be noted later, by "users", the audiences of websites are meant in this thesis. That is, while fully concentrated on keeping themselves current, web professionals also have some awareness of users' preferences that are changing constantly and the value of keeping those changes in consideration for delivering successful websites. However, this is not an important feature of their description of this experience. Therefore, as with the other three elements, consciousness of "users" is in the background of awareness in this way of experiencing the phenomenon of effective use of information:

> It's about keeping on top of … what people are liking, what they are not liking anymore (Int. 7).

Margin: There are two aspects in the margin of awareness of web professionals in this sub-category: information giving and clients. What web professionals never talk about in this sub-category is the value of giving information to the community of practice. Although following the community of practice and updating themselves with trends in the community of practice is the main concern of participants in this sub-category, they almost never mention that they feel the responsibility of keeping the community of practice up to date. Moreover, although web professionals in this category pay vague attention towards users (in terms of their effort to keep themselves informed about users' preferences), they never turn their attention to the clients. In fact, in this sub-category, delivering a successful website in terms of the client's satisfaction is never in the conscious awareness of web professionals when talking about their experiences of effective use of information. As will be noted later, by "client", the owner of the website is meant in this thesis.

Sub-category 1-B: Building a Knowledge Base

Meaning

Regarding Sub-category 1-B: Building a knowledge base, effective use of information is experienced as building, maintaining and using a knowledge base – in their minds, digitally or physically. While staying informed, web professionals may encounter some potentially useful information. They may decide to capture and store this piece of information in a knowledge base, in case they encounter an information problem at a later time for which that piece of information could be used. In fact, web professionals build the knowledge base with the aim of organising the practices that assist them to stay informed (e.g. "TweetDeck" (Int. 23) or "Bulletin board" (Int. 19)), to take advantage of it at a later time. This means that effective use of information in this case is only experienced if the stored information at one point of time is retrievable and usable at another point of time. The knowledge base they form might be internalised (i.e. a learnt thing or a knowledge base within their mind) or externalised (i.e. a physical or virtual knowledge base with a probable structure for information retrieval).

> My first thought [about effective use of information] is I really enjoy the process of gathering information and challenge sometimes in trying to keep it all in my mind and organise it, so I don't forget what I've gathered. I think a lot of times, it's just a short period when I'm trying to learn something quickly for somebody to do the design. Then, a month or two later, it's going to be gone. So, one of my challenges is trying to keep the important bits; either by writing them down or collecting them in a file or practising them in order to make them ingrained (Int. 19).

Structure of Awareness

Focus: The critical feature of this sub-category is storing information in order to retrieve it for a later use. This means that during a conscious effort exploring the information environment in order to stay informed (i.e. the focal point of awareness in the main category), they pay significant attention to capturing useful parts of the environment (i.e. the focus of the current sub-category).

> I keep the source code of all my websites and keep them structured in a way that makes logical sense. Then, every time I want to start a new project, I know exactly where to go to grab certain functions or certain aspects of previous projects that I really liked them and they were very good. In that way, I guess I recycle a lot of the information that I have used in the past (Int. 24).

Background: In this sub-category, two aspects of problem solving and keeping current exist in the background of awareness. Similar to Sub-category 1-A, problem solving is an element in the background of awareness of participants within this sub-category. Although

the distinguishing feature of this sub-category is storing useful information, the aim of this practice, to support problem solving, is an accompanying feature and therefore resides in the background of awareness of web professionals. Web professionals may also address another aim with this type of experience, which is organising their keeping-current activities and structuring their findings from the process of keeping current. That is, although their main focus of awareness is building a knowledge base, they are also aware of the value of keeping themselves constantly current. Nevertheless, their attention towards solely keeping current is not as strong as their attention towards building a knowledge base and therefore the element of keeping current resides just in the space that is surrounding their centre of awareness.

Margin: There are two aspects in the margin of awareness of web professionals in this sub-category: information giving and building a successful website. Similar to Sub-category 1-A, although web professionals use the information shared by the community of practice, they never mention the value of contributing their own knowledge for the benefit of the community of practice. Therefore, what they are not aware of is giving back to the community of practice and this pushes contributing to the community of practice into the marginal zone in their structure of awareness. Again, similar to Sub-category 1-A, they never talk about effective use of information in terms of building a successful website where success is defined as client's and users' satisfaction. That is, although in describing this experience they mention their ultimate aim in building a knowledge base, which is preparing themselves for future projects (building websites), they never mention client's or users' satisfaction in their description.

Dimensions of Variation

As was mentioned previously, Category 1: Staying informed has two dimensions of variation: "information" and "information use". These are described below.

Information: The dimension of variation of information in Category 1: Staying informed is characterised differently in its two sub-categories: Sub-category 1-A: Keeping current and Sub-category 1-B: Building a knowledge base. These are discussed separately below.

Information (Sub-category 1-A: Keeping current): In this sub-category, information is mainly characterised by emerging developments in the industry. These are "new stuff" (Int. 4) and "latest trends" (Int. 2) constantly appearing within the field of website design and

development. The quote below illustrates the mentioned developments that the participant considers as information:

> Large bits of information [is] a new framework [that] comes out. ... Basically either a new language or a new environment is a large piece of information that I just need to learn (Int. 18).

Besides the emerging developments, quality information such as best practice can also be seen as information in this sub-category about which web professionals keep themselves current:

> There will be several award winning website design sites in there. I'll be constantly looking at those websites and then I go: "What do I like about that? What don't I like about that? Why did they choose it? What do they say about it?" (Int. 14).

To elaborate on this form of information (i.e. developments within the industry), web professionals in this sub-category see their field of work as an information environment in which information is "floating around" (Int. 23). To survive within such an information environment without being surpassed by other practitioners, web professionals recognise the necessity of being vigilantly sensitive to any changes, emerging trends or developments in the industry. They also see the value of familiarising themselves with and keeping themselves current concerning these changes. The quote below illustrates how the participant relates the need for being sensitive to developments within the industry (i.e. the newest technologies) to survive (i.e. get employment) and not "going into trouble" (Int. 10):

> For getting employment, you have to keep yourself up to date, and for that purpose, you have to study. It's inevitable. A developer has to read in an ongoing way. They have to read and study the newest technologies related to their job (Int. 10).

In fact, the sensitivity to keep current is the essence of the meaning of the experience associated with this sub-category. Therefore, as it is these developments and their associated aspects that stimulate this type of experience, they are considered as information within this sub-category. Subsequently, the main source of information in this sub-category is the community of practice. The community of practice is the context within which the mentioned information environment sits. Web professionals engage with this information environment, its developments and changes. Through this practice, they all together make sense of this information environment, shape it and expand it. An example of this is where a participant describes her engagement in the information environment shaped by the community of practice:

> It's following key blogs on the internet. So, it's not only just one person saying "Oh! yeah! I'm great! I did this project, I did that project!"; but when you can have the communication going,

> when you have got a discussion forum, people saying: "I'll have a lot of clients asking for this", you see a merging trend coming up. That's the actual point of taking advantage of that not just seeing that as pass you by (Int. 7).

The key informing role of the community of practice in keeping web professionals up to date is also obvious where participants talk about "following information management groups" and "blogs" *(Int. 23)*, "using word of mouth" *(Int. 4)*, "using tutorials shared by the key informants of the community" *(Int. 7)*, "referring to the community of practice" *(Int. 18)* in order to keep themselves current. However, the information that the web professional is looking for may be found in different places within the community of practice. That is, there may be different secondary sources of information with the main information source in this sub-category.

For example, a web professional may learn about the latest trends in a monthly local forum:

> They have these Brisbane Web Development meetings which is a good forum to keep informed on what's going on in the community (Int. 4).

The newest trends may also be found in "key blogs" (Int. 7) or by following experts and reliable resources within the field:

> I follow information professionals, user experience people; the experts. I follow some organisations, for example W3 School. I follow blogs or IBM on my reader (Int. 23).

> I keep up with online information. … There's a blog called "A List Apart" that is pretty standard. It's considered a very well-respected web design and web best practices standard journal. There are various individuals that I follow either on Twitter or just through RSS feeds of their writings (Int. 19).

Web professionals also learn new skills or renew their current skills (i.e. keep themselves current with movements) by watching tutorials and being "in these educational sites" (Int. 10) produced by key people in the community of practice:

> I try to dedicate a couple of hours a week to going through different websites, having a look at tutorials, trying to learn new skills. Cause my design area is not as strong as my development. I'll try to do tutorials to learn different things. It's constantly trying to teach myself new things (Int. 7).

Similar to what will be seen in Category 3: Problem solving, books have been mentioned as one source of information within this sub-category. But again similar to that category, the fact that books do not offer very updated information for this field of practice, prevents books from being considered as a primary source of information in this sub-category:

> You have to know this stuff and read about them. No one teaches you them. You can read books about these things. But the problem is that books are so slow. The books in the market are out dated. It may take one year for a book to be written, get published and come out. And in a year, the technology has changed a lot. The fastest way is searching the internet (Int. 10).

The issue of currency seems to be also related to the content (information) delivered within universities. The quote below from one of the interviews demonstrates very well why, in spite of having education, seeking new developments within the industry is necessary:

> You always have to keep an eye on changes. Otherwise, in six months you will be out of the game. You have to be in W3C constantly. All the definitions that you need to be kept up of come from there. … These things are not taught in universities. Because in three years, when you want to apply them in your job, you would find that they are out dated and replaced by new things. You yourself have to read about this stuff (Int. 10).

Information (Sub-category 1-B: Building a knowledge base): In describing web professionals' perception of information in Sub-category 1-A: Keeping current, it was mentioned that web professionals find themselves in an information environment with information floating in it. Then, it was discussed that information in that sub-category was experienced as developments and changes within that information environment. In this second sub-category, Building a knowledge base, web professionals are still concerned about the information environment and floating information within it. However, here information is experienced as parts of that information environment that web professionals evaluate as potentially useful for future use and, as a result, are being selected, stored and accumulated into a knowledge base over time. This creates a storage of past knowledge that is ready to be used when there is a need.

> I've collected resources during that course. Then, when time has been, I can just easily access to them. Now, I have a bank of resources that I can access to when I want. … Then, when it comes to doing something, I can go: "Oh! I've read about that! I can look into my bank of resources." I can pull off that. It's quite easy for me (Int. 23).

Therefore, information experienced in this second sub-category includes potentially useful chunks of information, like what was mentioned in the quote above. An interesting article, a blog post or a website are examples of potentially useful chunks of information, which are parts of the information environment and which could be stored, filed or bookmarked. In addition, whole or parts of a project that the web professionals themselves implement can be evaluated as potentially useful for future use and subsequently considered as information for this sub-category. The underlined section in the quote below indicates what a web professional means by storing the whole of various projects for future use. The reason a more complete form of the quote is shown below is to provide the background of the

situation for the reader. However, it should be acknowledged that this quote includes a shift in web professionals' focus of awareness from one type of information to another. The web professional is first talking about different information resources as one type of information (as in Category 3: Problem solving), then suddenly shifts his focus to past knowledge which is the form of information being discussed in this sub-category:

> If I have a question and I have asked everyone in the office, nobody in the office has seen this before and we've looked at our previous projects [and we've found that] we've never encountered this before, again these are all also sources of information: we keep a copy of all of our previous projects. In case we encounter the same difficulties, we see how we solved it before (Int. 5).

As mentioned above, part of previous projects that the web professional implemented in the past could be considered as information. An example of using parts of a project (blank templates, in this case) as information is indicated in the quote below:

> I normally have some key templates that I work with to reduce my [project time duration]. They're not ones that I've bought, but the ones that I have created myself. I've got blank structures that I use and be able to fiddle around with that for my design purposes. … I've got my standards over there and then have to build the custom functionality on top (Int. 7).

It should be noted that all forms of information discussed so far are tangible and external. An article or a link to a useful website exists physically or virtually and independent of the web professional. This form of tangible information is in contrast to a second form of information that makes sense only in a web professional's mind. An example of the latter experience was traced in an interview where the participant, while talking about keeping current practices, very concisely but explicitly mentioned a knowledge base in her mind along with information stored there. Similar to the above, the quote here includes the context for clearer understanding. Similarly, the relevant part of the quote is underlined:

> I have a judgement or critical eye to every website that I look at on. It goes everywhere. I look at a billboard, I look at the TV ad, I'll always be judging and ask whether I like it or not. … What about it I liked and did it work for the product it was selling or the people it was talking to.
>
> Interviewer: Could you tell me more about these experiences?
>
> They just pile up in my brain. … I'll use that information at all sorts of times. Whenever I'm briefed on a job, … [or etc.], I'll call it up. I mostly use experiences that are related to that target market or the group of people they're talking to, or whatever you are trying to simulate (Int. 14).

It should be noted that this type of information is very difficult to retain, to form a stable knowledge base, and therefore may be followed by problems in retrieving it at a later

time. In response to the researcher's question on their ability to find this type of information, a participant stated:

> Sometimes not [it's not possible to find them or it takes more time to find it]; because I don't store my information. It's just reading. I read and pass. Later, I can remember that I'd read this, but I can't find it then (Int. 23).

Therefore, although this mind-information could form part of the web professional's knowledge base, it appears to be necessary for web professionals to store this type of information in other ways that are more reliable. These reliable ways do not necessarily mean storing information in tangible forms, however. This is shown in the quote below. Here, in addition to writing down information or filing it, the web professional puts the information into practice to make it ingrained and therefore not forgettable:

> One of my challenges is trying to keep the important bits; either by writing them down or collecting them in a file or practising them in order to make them ingrained. So, I think for me, I'm effective at that [use of information] when I have mastered it and made it part of my repertoire and don't have to re-learn it (Int. 19).

However, this does not seem to be practical for every piece of information that they encounter.

Information use: Since the dimension of variation of "information use" shows quite different characteristics in the two sub-categories 1-A and 1-B, it is discussed separately below.

Information use (Sub-category 1-A: Keeping current): The dimension of variation of information use in this sub-category is mainly characterised by the act of scanning the information environment.

The main aspect of this scanning act is its continuity. That is, information use, when experienced as a scanning act, involves continuous engagement with information. This continuity is all about constant scanning of the information environment. This is a general, steady activity that does not only happen in specific situations, but is derived from a desire to stay at an ideal level of knowledge, which should be constantly maintained. For instance, parts of the data that show participants' commitment to keeping current, such as trying to "dedicate a couple of hours a week ... to learn different things" (Int. 7) or "following professionals on Twitter" (Int. 23 and Int. 13), are evidence of this constant engagement with information. The quote below is one of the many quotes related to this sub-category that emphasise continuous monitoring of the information environment:

> You always have to be in these computer weblogs and forums and educational sites to see what's happening out there. You have to be curious about what's going on. Even if you are not reading what's there in detail, you can take a look at titles to know about new and unfamiliar stuff. Then, at least, you can go to Wikipedia and read the definitions. Then, you'll know if it's related to your working area, how the usage variety is and how old it is (Int. 10).

Since keeping current is the core meaning of this sub-category, web professionals here see environmental scanning as an independent activity that they allocate a specific time to, such as "every Saturday morning" (Int. 23) or "a couple of hours a week" (Int. 7) or, as in the quote below, the "evenings":

> One thing is just keeping track of what's going on in the community as a broad thing; not specifically when you're working on something; but just something that keeps you going. … This is something that I would probably read in the evenings; just with my iPad on the couch and just browsing through. I'm not developing something. I just want to know what's going on (Int. 4).

In addition, two different modes are distinguishable for the scanning act. Not all web professionals experience both of them. The two modes are active (manual) and passive (automatic) scanning. In the active mode, web professionals look for updates in the field. An example is a time when they hear about something unfamiliar and new. Being in active mode, they look for it and inform themselves about it. The quote below shows this:

> I hear about a technology like HTML5 or something to do with jSon or XML. I may not know exactly what it is. So, I may go find a tutorial that shows me what is involved (Int. 19).

Then, in passive mode web professionals let information stream to them. For this purpose, they may use different technology or tools. A sample case is the time when they read their tweets on Twitter or TweetDeck, as in the quote below:

> It's constantly feeding me and my TweetDeck. Stuff are streaming to me. So, I know what's happening in the external world (Int. 23).

Scanning the information environment could be conducted through different channels. This act may be implemented via "talking" with the information environment, "watching" it and "reading" it. Selection of each channel is in direct connection with the information resource web professionals choose to use. For instance, when web professionals choose local forums as an informing source, they communicate with the information environment through talking with peers:

> That sort of stuff is like word of mouth. You sort of ask someone around you (Int. 4).

Here peers are components of the information environment and talking to them is a channel to communicate with the broader information environment. Another example is when

web professionals constantly “read about latest web trends” (Int. 2 and Int. 23) and “developments” (Int. 8) within the industry:

> It’s constant reading and knowing what’s happening out there (Int. 23).

In this case, text content such as books, tweets, blog posts and RSS feeds are components of the information environment and reading this content is the communicative channel of the web professional for interconnecting with information.

Another example is when web professionals watch “tutorials” (Int. 19) within different educational sites. Here, video tutorials are components of the information environment and therefore watching them is the communicative channel through which web professionals engage with information.

Information use (Sub-category 1-B: Building a knowledge base): Information use in this sub-category is mainly characterised by sifting, storing and retrieving acts. This involves a quick evaluation for choosing the potentially useful parts and storing those parts in a knowledge base. This way of experiencing information use normally accompanies other information use experiences, such as monitoring the information environment (i.e. information use in Sub-category 1-A: Keeping current) or solving a problem (i.e. information use in Category 3: Solving a problem). That is, when web professionals engage with information in different ways, they are likely to find parts of the information environment not immediately, but potentially useful. Therefore, in the middle of one specific act of information use, they may decide to keep that specific part for later use. This leads to performing a storing act, which eventually results in forming a knowledge base. For instance, during searching for particular information and exploring specific information resources (i.e. experiencing information use in Category 3: Solving a problem), web professionals may also encounter information which could be of use at a later time. They may decide to store such information in order not to lose it. The quote below is an example:

> For example, when I go into Google to look for a specific thing, I may encounter with ten other interesting things before I get to that first thing and I think: “Oh! This could be helpful if I wanted to do task X” and I keep it! Or I save the link and will read it later at home (Int. 10).

Some other participants described the storing act as following the scanning act. In these situations, they store as they perform keeping current activities within their surrounding information environment. The quote below demonstrates such a situation, which is related to the participant’s mind knowledge base:

> One thing is just keeping track of what's going on in the community as a broad thing; … then you actually have a job to develop a website. You have these things all back of your mind and you know "ok! that's a problem and I read about this in a blog two months ago where someone did the same thing". So, I can easily go back and take a look at his specific code, what he did and how he implemented it (Int. 4).

As can be seen, the participant above does not mention a structure for his knowledge base. However, there is a chance that, as they perform the storing act, web professionals also define a structure for maintaining the separated items from the information environment. The quote below shows an example in which the participant describes the structure of the knowledge base that he has created to maintain his code:

> I would take every piece of code that you get and index it in a directory structure on my computer. It is catalogued according to different types of programing code like HTML and JavaScript and etc. Then, there are deeper structures. You have got your Controller, which is script that performs a certain task. You have got your Model, which is another type of script. You would get all of these structures. It's almost like a tree structure in your directories (Int. 24).

Another similar example of knowledge base structure is bookmarking web content under different labels:

> If I see stuff on the web, I just bookmark the link and just put in a keyword. I have a keyword for "web stuff", "web development", "web design", ... and this sort of stuff (Int. 4).

In building and using a knowledge base, another act of information use is retrieving stored information. The data reveals that web professionals who store information in their mind might find this type of engagement challenging. Mind information is forgettable, and therefore, not easily retrievable. The quote below is an example:

> Sometimes, I'm not always able to find one piece of information if I need it; because I don't store information I read and pass. Later, I can remember that I'd read this, but I can't find it (Int. 23).

Some participants mention the importance of the knowledge base structure in retrieval. In explaining why he defines a structure for his knowledge base, a participant stated:

> You can't remember where you put things and what you did previously. It's impossible to really keep track of everything that you've done (Int. 24).

Similar to Sub-category 1-A, the feature of continuity of information use has a value here. This is about being constantly attentive to potentially useful parts of the information environment, in order to store them in a knowledge base. For instance, participants' mention of keeping "all the previous projects" (Int. 5) or "the source code of all websites" (Int. 24) implies continuity in the information use of web professionals.

Summary

Table 4-1 provides a summary of Category 1, where effective use of information is experienced as staying informed.

Table 4-1 Summary of Category 1: Staying informed

Category 1: Staying Informed		
Key quote	*I think in terms of … using information effectively, it's about knowing what is out there; not specifically how it's done; but how it can be done and who has done before and way to find information if you need some time. You develop this catalogue in your brain; knowing of what sort of techniques people use and knowing where it is (Int. 4).*	
Meaning	Effective use of information is experienced as scanning the information environment and storing the useful parts of it in a knowledge base for a potential future use.	
Focus	Being informationally vigilant and equipped	
Sub-category 1-A: Keeping Current		
Key quote	*I follow information management groups or information architects. I'm just feeding. It's not quite a static thing. It's constant reading and knowing what's happening out there. It's a mash-up of all these ideas that are floating around (Int. 23).*	
Meaning	Effective use of information is experienced as scanning the information environment in order to stay informed, updated and skilled, to move with advancements in the industry and to not be surpassed by others.	
Structure of Awareness	Focus	Awareness of the current information trends and maintenance of this state of being informed.
	Background	Knowledge base, Problem solving, Users
	Margin	Information giving, Clients
Dimensions of Variation		
Information		Emerging developments within the industry
Information use		Scanning the information environment
Sub-category 1-B: Building a Knowledge Base		
Key quote	*My first thought [about effective use of information] is I really enjoy the process of gathering information and challenge sometimes in trying to keep it all in my mind and organise it, so I don't forget what I've gathered. I think a lot of times, it's just a short period when I'm trying to learn something quickly for somebody to do the design. Then, a month or two later, it's going to be gone. So, one of my challenges is trying to keep the important bits; either by writing them down or collecting them in a file or practising them in order to make them ingrained (Int. 19).*	
Meaning	Effective use of information is experienced as building, maintaining and using a knowledge base.	
Structure of Awareness	Focus	Storing information in order to retrieve it for a later use
	Background	Problem solving, Keeping current
	Margin	Information giving, Clients, Users
Dimensions of Variation		
Information		Potentially useful parts of the information environment
Information use		Sifting, Storing and Retrieving

Category 2: Building a Successful Website

Meaning

For Category 2: Building a successful website, effective use of information is experienced as building a successful website. This type of website delivers the client's message to the user via a seamless system. However, based on obtained data, web professionals in this study do not talk about the successful website as a whole (i.e. simultaneously considering the client, users and the website as three stakeholders). In other words, in this category, web professionals are normally aware of one stakeholder at a time and define s*uccess* in regard to that specific stakeholder. This gives three different meanings for success: (a) success in terms of building a website with which the client is happy; (b) success in terms of building a website that suits the exact needs of the ultimate group of users; and (c) success in terms of building a seamless working website with which the web professional is happy. However, due to a significant degree of similarity between these three meanings, they are placed under a more general meaning: building a successful website. These three meanings form the three sub-categories for the main category of "building a successful website". Each sub-category is discussed separately below.

Focus

In general, the main focus of awareness of all web professionals, regardless of the mentioned triple approach to stakeholders, is delivering a successful website. However, taking each different understanding of *success*, there appears a secondary focal point for each definition which is (a) client; (b) users; and (c) website-web professionals. In other words, throughout this experience, building a successful website remains steady, while the understanding of success varies. That secondary focal point is always intertwined with the main focus. This is shown in the figure below.

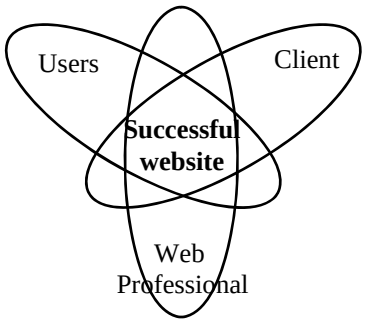

Figure 4-1 Primary and secondary points of awareness in Category 2: Building a successful website

Based on the three variant focal points of awareness in this category, three sub-categories are recognised that are discussed below in terms of their referential aspect and structural aspect.

Sub-category 2-A: Making the Client Happy

Meaning

Effective use of information is experienced as building a website which meets client's needs and requirements. As a result of effective use of information in this category, the delivered website is what the client is happy with. Therefore, gaining a clear understanding of the client and his/her needs is necessary in this experience. The more the understanding is articulated, the more the use of information can be effective. That is, a misunderstanding about a client's needs results in a failed project, which could indicate ineffective use of information. Information professionals achieve understanding about a client and his/her needs by different methods. For example, one participant explained:

> [For an example of effective use of information] I think I am going to go back to the requirements document that is the single most important document of information that lists out everything that is needed, everything that is going to be needed, everything that is expected and everything that needs to be delivered in the end. In the end, it all boils down to what was in the client's requirements. That's what my work is based off of (Int. 5).

Structure of Awareness

Focus: Along the main category's focus on building a successful website, the focus of this sub-category is on the client and his/her needs. Therefore, effective use of information is seen as if the client and his/her needs are well sought, understood and met.

> If the client is happy, I'm happy. In my particular work, pretty much if the person I'm doing the site for … is satisfied with the results, then that's how I know we've done good (Int. 12).

Background: The background of web professionals' awareness in this sub-category includes their own role in building a successful website for the client, and focusing on meeting a client's needs. In this study, there are some occasions when participants point to using their knowledge, skills and competencies that lead to successful website development from the client's perspective. In fact, for building a successful website for clients, web professionals may use their knowledge, skills and competencies to educate the clients and make them aware of what they really need. For instance, some participants mentioned the importance of effective communication skills, which are used to gain a clear understanding of

the client. However, their self-awareness is not a critical feature of this category. Therefore, it recedes to the broader context that is surrounding their focus of awareness.

Margin: When experiencing effective use of information as building a website for a client, the community of practice is not a critical feature of participants' descriptions and therefore is in the periphery of web professionals' awareness. As was mentioned above, what is located in the focus of awareness of web professionals in this sub-category is consideration of the client. Through a relationship between the client and web professional, an awareness of the web professional's role is recognisable in the context, which surrounds the focal point. An extension of this relationship to the periphery of awareness shows little interest to take part in the community of practice for web professionals, and therefore the element in the margin of awareness is the community of practice and the value of information sharing. That is, the structure of awareness in this category starts from a focus on building a website for a client, continues to a less highlighted focus on the web professional's role in the background, and extends to a vague awareness of the community of practice and taking part in such a community in the periphery of their awareness. As a result, for example, they never show an intention to use best practice made available by the community of practice, in order to save their time or guarantee the credibility of their work.

Being unaware of the value of the community of practice specifically became clear from an informal conversation after one of the interviews that had held a strong focus on "listening to the client". As the interview was finished and the researcher did not intend to capture more data, she asked the interviewee about the role of the community of practice in effective use of information and actually introduced attention to this element to the conscious awareness of the participant. Participant's response of "these are two totally different things!" showed that she completely avoided considering the community of practice as a source of information, which lead her to not see taking part in such a community as a way of using information effectively. In fact, for her, being part of a community of practice and taking advantage of that did not have any value in terms of effective use of information and therefore such value was located in her periphery of awareness. It is acknowledged here that although this data was obtained through a practice contrary to phenomenographic rules, due to the interesting insight it produced, the researcher reports it here.

Accordingly, all other related elements of effective use of information which are connected to web professionals' self-awareness are also pushed into the margin of awareness.

For instance, they rarely mention building and using a knowledge base or keeping current in describing this experience.

Sub-category 2-B: Making Users Satisfied

Meaning

In Sub-category 2-B, effective use of information is experienced as building a website based upon groups of users' characteristics. This is a website that is usable for a group of target users and has the capacity to satisfy them. Therefore, seeking and gaining a clear understanding of users and their characteristics is necessary for this experience. The more this understanding is articulated, the more the website is what the user population needs and, as a result, the more the information use happens effectively. That is, a misunderstanding about users and their characteristics will result in a failed project, which represents ineffective use of information. A clear understanding of users and their characteristics is achievable through different ways and various resources. Effective use of information (i.e. success) in this sub-category then is assessable based on users' feedback or usage. "Clients" and "people" in **bold font** in the quotes below both refer to users:

> Depending on how many, what the **clients** [i.e. users] are and who we are talking to, I'll be looking at those sites that those people tend to be looking at. [I'll] be looking for what elements make it inviting to that group of people (Int. 14).

> Effective use of information for me is **people** being able to use information effectively in their everyday jobs to make those decisions that they have to do in order to function (Int. 23).

Structure of Awareness

Focus: The distinguishing feature of this sub-category is users and their characteristics (in contrast to the client or website-web professionals in the other two sub-categories). When building the website, web professionals mainly consider users and assess their own final success (i.e. effective use of information) based on users' usage and feedback.

> Then when a more senior person came on board, she said "Oh! No! They got you off on the wrong foot. We're actually using this website to appeal to government people, to public servants. I'm going to use this to advocate for refugees and win money; where you get money from ministers for refugees' issues. It's going to be quite serious. It can't be all cute and bubbly and green and curvy". With that [information], I completely redesigned the things from the ground up as it was a whole different thing; knowing now what the audience was going to be-which were public servants working nine to five, serious people with haircuts and ties, don't have time to waste, don't want to spend a lot of time on the things that need to find their info. The site needs to look serious and professional and a little bit corporate, minimum colours and minimum flashing things (Int. 2).

Background: When web professionals describe their experience of effective use of information as building a website that specifically satisfies a group of users, they are also partly aware of the client of that website. In this experience of building a successful website, the only critical feature for web professionals is considering users and their characteristics in order to deliver a website that is usable for and appealing to them. However, they may return to the client at some stage to gain a clearer understanding of the group of users. This locates the client in the background of awareness of web professionals who see effective use of information as satisfying users.

Margin: Similar to Sub-category 2-A, the community of practice is not a critical feature of participants' descriptions in this sub-category and therefore it recedes to the margin of web professionals' awareness in this sub-category. This means that when describing their experience of building a successful website, none of the participants talk about the importance of taking part in a community of practice for more effective use of information.

Sub-category 2-C: Building a Seamless Website

Meaning

Sub-category 2-C presents that effective use of information, from the web professional's perspective, is experienced as building a website based upon the web professional's expectations of seamlessness. It assumes that a website works seamlessly or with minimum "bugs and errors" or "side effects" (Int. 24). It is a website with which the web professional is happy and satisfied. The success (or effectiveness of use of information) in this sub-category is assessable based on the web professional's view, test team's reports, issue tracking systems reports or feedback from users of the website.

> It's very hard to say that [information use] is effective, unless they tested it [the website] against five different other ways and found out which is the most effective way [of using information]. ... If you wanted to know if your way was effective or not, the only real way to do it is to test it. I recommend we do this, but I can't tell you if it's effective, unless we test it again, see the alternatives and do a control test (Int. 17).

Structure of Awareness

Focus: The web professional's primary concern in this sub-category is building a seamless website. In fact, in seeing effective use of information as delivering a successful website, the key element which appears in the focus of awareness of web professionals is the website itself as well as the their own satisfaction. That is, when defining success, web

professionals pay a great amount of attention to website seamless performance or their own satisfaction as an expert in the area. The quote below is an example of a time when one participant consciously talked about his experience of effective use of information as building a website free of "side effects" such as "errors and bugs". The researcher interpreted this as seamless performance of the website:

> In most cases, you probably don't know [if your use of information has been effective] until a little while later; because to know if it was effective or not, you need to know if … you got any side effects … like errors and bugs and those sorts of things. And if a lot of those appeared, then obviously it wasn't really effective; because you have to come back and fix things and change things around (Int. 24).

Background: When web professionals place their focus of awareness on meeting their own expectations in terms of building a seamless website, the users and clients are pushed into the next level of awareness (i.e. background of awareness). Although they are mainly focused on the seamlessness of their websites, they assess this success based on users' or clients' feedback as well. Moreover, they are partly aware of the community of practice and rely on them for dealing with possible bugs and errors. The movement of the community of practice one step forward, from the margin of awareness in Sub-categories 2-A and 2-B into the background of awareness of this Sub-category 2-C might be related to the web professionals' clear self-awareness in this sub-category. That is, since web professionals are aware of their own role and practice, it makes sense that they are somewhat aware of the community of practice as their professional reference. This level of awareness places the community of practice in the background of awareness of web professionals. This is also confirmable with respect to the relationship between the web professional, the client and the community of practice mentioned in the structure of awareness of Sub-category 2-A. Positioning somewhere in between, when the web professional is in the focal point of awareness, the other two ends of the continuum should locate somewhere in the background of conscious awareness.

Margin: Staying informed is never mentioned in describing the experience of effective use of information as building a seamless website. Therefore, this element is placed somewhere in the margin of awareness of web professionals.

Dimensions of Variation

As was mentioned previously, Category 2: Building a successful website has two dimensions of variation: "information" and "information use", which are outlined below.

Information: The dimension of variation of information in the category of building a successful website is characterised differently due to the attendance of different sub-categories, which hold various distinguishing features of awareness. Therefore, information characteristics for each of these sub-categories are described separately below.

Information (Sub-category 2-A: Making the client happy): In this sub-category, information is mainly characterised as the project requirements, which come from the client's side. The quote below shows this well:

> It's really just listening to the client and extrapolating from the initial interview "what the site is and what it is supposed to do" and then focusing on that (Int. 12).

This implies that "the message" (Int. 3) of the website stated by the client is also informing for web professionals:

> What does the site need to get across to the user? That's information or content that then goes out to them. Then, that information for example, helps me with "Do I make this a busy site visually?" or "I'm going to make this incredibly lean and empty site visually" (Int. 2).

Although the project requirements that the client provides are the main form of experienced information for this sub-category, there are also some other types of information associated with the client that the web professional takes advantage of. For instance, in order to ensure effective use of information, web professionals may recheck the project progress with the client at certain intervals and modify the work based on their feedback. Here, the client's feedback is information for the web professional:

> There have been examples where I developed a website that I thought was absolutely beautiful … Then you show it to the client and the client hates it. This is that feedback loop from the client which is really the only way that I can figure out if the work that I've done has been successful. This is how we evaluate success (Int. 5).

Related to the project requirements, the web professional may also see the client's identifier elements as information. Some examples of these elements are client's "logo" (Int. 2), his/her "corporate colours" (Int. 2), "business cards, newspaper ads and brochures" (Int. 14). These elements play a guiding role for the web professional to build the website in a way that replicates the virtual image of the client. An example is when an interviewee had to use the client's corporate colours for their website:

> Their corporate colours were orange and dark grey blue. ... I tried to incorporate those colours and the logo branding elements. So, the website looked and felt like it identified with everything else of their brochures and their business cards. So, [for] a person who's already interacting with the brand, the website would still look like the right. We wouldn't go with cream and yellow; we keep to the corporate colours (Int. 14).

Constraints as part of project requirements could also be considered as information. Constraints for this interviewee are informing in a way that helps him to reject many possible options in order to become closer to what is more suitable for the client. In the quote below, among many options for picking a colour or font for his client's website, the participant looked at the client's logo and used a similar colour or font in the client's website:

> You need to have all these constraints. If a client has no idea what they want their site to look like … I will tell them: "What's your logo? Just give me a logo! At least I'll get an idea of what you're going for. I'll have an idea of a couple of colours, maybe some font types. Then I can run with that" (Int. 2).

Project requirements are often linked to the industry or business context in which the client is acting, as well as his/her competitors. Thus, information in this sub-category may be associated with the client's competitors as well as conventions within the industry. One participant explained how she gets a clearer view of the characteristics of the website she needs to build by viewing competitors' websites:

> After having that discussion … I tend to start looking at who their competitors are, understanding other websites in that area and what the conventions are in their industry that are going to help them gain customers or sell a service that they have been trying to do. [I] look at ways … to convey their personality, and what makes them different (Int. 19).

From the statement above, in an endeavour to understand competitors and the business of a client, it is also possible that the web professionals consider the public's (consumer's) feedback as information. That is, they use the reviews that the public provides about their clients and their competitors as pieces of information. This sometimes helps web professionals to view the differences between their own client and his/her competitors. The quote below illustrates this. Moreover, the organisational culture of the client's company is another type of experienced information, which is also observable in this quote:

> Sometimes, we look at the reviews within the forums about them. Even their organisational culture could help. When we go inside the company and talk to them, we can see that what is very important for them in their company; for instance, is it their clients or interest or initiative on which they are focusing? (Int. 13).

Accordingly, the clients are the key source of information in this sub-category and most of the mentioned types of information are derived from them. However, it is interesting to note that they may not be able to give all this information to the web professional or at least may not be aware of the importance of providing the web professional with all of this information. In some cases, it is even possible that the client "gets the designer off on the wrong foot" (Int. 2) by giving wrong information or not presenting enough or necessary

information. Hence, the role of the web professional in extrapolating the right information is highlighted in this sub-category. The quote below is an example of a time when, due to communication issues, the client was not able to give the right information to the web professional:

> Unfortunately, they could never tell me of that. It could have been the language things. They were Russian. It could have been that we couldn't communicate very well with each other. That is an example of information that I never got. So I couldn't make the thing for them and it really annoyed me (Int. 2).

Information (Sub-category 2-B: Making users satisfied): In this sub-category, information is mainly characterised by the user population. In a broader sense, users' characteristics and all the associated aspects of them are experienced as information in this sub-category. In the quote below, the interviewee demonstrates how the user population of the website (refugees, in this case) influenced the design of the site:

> The site that I did for the refugees- to me- was about freedom. So, I wanted the site to have a lot of space. I wanted it to have a lot of blue, because Australia is a big open blue sunny thing and I wanted people to get that feeling. So, you do anything you can to try to replicate the feeling to the user (Int. 2).

In a similar situation, the characteristics of the users, who are visually impaired people, guide the web professional to build the site in a way that is usable for them. According to this participant, neglecting the important characteristics of users may lead to building a useless website:

> Visually impaired people don't see any of those beautiful things in a reader browser. They just get the word written out to them. If those words are badly organized and don't make sense, then there is no website for them. It's like putting up a building and not having a wheelchair ramp basically for letting them get in to your site (Int. 2).

In order to expand their knowledge of the characteristics of the user population, web professionals may conduct research about it. This research practice includes talking directly to the user population, consulting with the users' surrounding community, or referring to formal research material about them. The outcome of this research practice is then another form of information experienced in this sub-category. A good example is observable in the quote below where the participant was supposed to build a website for a special group of primary school students that had a different learning pattern in comparison to other students:

> We've had to do a fair bit of research and talking to the elders [about] what the best way is to approach the kids to be able to want to use the technology. … So, we talked to the teachers, the students themselves and their parents to find out how they actually learnt. There is a little bit of research out there, but there isn't that much about that type of education (Int. 7).

Similar to Sub-category 2-A, feedback plays an important informative role in this sub-category. However, here the feedback comes from the users' side. As the focus is on users of the site in this sub-category, whatever users think, need and prefer is experienced as information by the web professional. Therefore, the web professional may refine the website based on what the user group would like to see:

> Once you upload it to the net, you start getting your first views … and that information is coming back to you. So, you would think how to best refine the site? (Int. 12).

In cases where web professionals need to have a more extensive understanding of users' interactions with the website (i.e. more vivid and rich information), they may take advantage of different user testings and usage tracking. Web professionals experience the results of these tests and the analytics as information to guide how they modify their design to increase user satisfaction. The two quotes below show how web professionals use the outcome of user testings and analytics produced by usage tracking systems, respectively:

> I used usability testing to see how they are acting. To know how they are thinking, I used a focus group and to tease it out a bit more, I used an in-depth interview (Int. 23).

> I took the art museum [website] … and made it just image-driven. It's really just about the images; because it's an art museum. We wanted it to represent a gallery, sort of experience. Suddenly, it was full of these huge images and I thought "Oh! How big can I make these exactly?" I went and had a look at the users [usage analytics]. The most of them were still on 1024X900 screens. I though "Well! 1024 is as wide as I can get". ... So, I can't make website as I like that, because people wouldn't see it. It just should be annoying them; having re-scrolling after the site all the time (Int. 2).

Information (Sub-category 2-C: A seamless website): In this sub-category, information is mainly characterised by the side effects that occur in the function of the website. These side effects include errors and bugs, and general technical issues that occur when a website is being used. Web professionals consider these side effects as information and use them to refine the website in a way that works seamlessly. These side effects could appear in the form of an error message:

> Normally you see the error; maybe a message comes up on the screen saying: "This function is incorrect, because of something". What you do is you try to trace back all the steps that the code has to take. You start from the end result. That's where you got the error. You take step back to see where the trace and the program have been and what happened. You follow this trace back to the origin of the code where they might be some inconsistency. ... When you found the problem, that's when you can sort it out (Int. 24).

The side effects may also be in the form of error reports. These reports are generated by support ticket systems that process the errors and log the related information into a database.

The web professional then uses these logged files as information to refine the website. Error reports may also be provided by test teams that help the web professional to identify the current bugs within the system. The test team uses some scenarios pre-defined by web professionals to find any existing bugs and errors within the system, to report them back to him/her. Web professionals then utilise these reports to modify the system.

> These error reports are another type of information that users can't give us and help us with. Instead we produce software called support ticket that asks users to contribute in sending errors that happen in the software [website]. … This information gets logged somewhere and the developer can use it as a piece of information (Int. 11).

As will be seen in Category 3: Problem solving, one form of information in that category is a solution to a technical problem. This is while what constitutes information in Sub-category 2-C is the technical problem (bugs and errors) itself. In simple words, information that appears in the form of problem in one sub-category, is experienced in the form of solution in another category.

Information use: As explained previously, information use is differentiated from effective use of information in this thesis, since the former involves the act of engaging with information, rather than the outcome. Due to the various distinguishing features in the awareness of web professionals with regard to building a successful website, the dimension of variation of information use is also experienced differently in each sub-category, and therefore is discussed separately below.

Information use (Sub-category 2-A: Making the client happy): Information use is seen in the form of an act in all categories of description, including Sub-category 2-A. Information use for web professionals in this sub-category includes developing an understanding about a client's requirements and translating it to a website.

The act of information use is manifested in different forms in this sub-category. The most important form of information use here is communication that occurs between the web professional and the client. It is through the process of communication that web professionals extract all the required information, of any possible type, from the client in order to develop their understanding of the client's needs and build the website based on that understanding. The participant below saw it necessary to build a relationship with the client to gain a rich understanding about him/her:

> What I found necessary is that it's a very long process of building a relationship with the client to be able to understand who our client is and who their clients are. … It's only through a process

> like that that we are able to really get down to the depth of knowing who our customer is, who their clients are and what their problems are (Int. 20).

A successful process of communication often starts with information gathering, which is conducted in different ways or by using different tools. One simple tool is a "questionnaire" (Int. 20, Int. 19):

> I try to learn about their business. ... I try to have a lot of verbal and written conversation. I have a questionnaire that I ask people to complete. It's about four pages long that asks them those same kind of questions. I follow up and try to understand if there is something that is not clear to me (Int. 19).

However, the web professional also has to consider other ways to achieve as much information as possible:

> I have to perceive that I can't simply get those answers through a questionnaire or through a conversation per se a lot of time; specifically I mean it happens in an intuitive way and through different interactions between a client from a phone call to email interactions and to face to face interactions, if that's necessary (Int. 20).

Sometimes clients are not very clear about their needs and therefore they are not able to provide the web professional with enough or useful information. The data shows that web professionals may deal differently with such situations. The participant above described these kinds of clients as "inefficient in the process" (Int. 19), but did not mention her strategy for dealing with these kinds of situations. Based on another participant, the logical consequence of this approach will be delivering a website that is not exactly what the client wants:

> To be honest, a lot of times, it's not exactly what they want. The problem there is the requirements phase. Many clients don't know what they want exactly or they don't express it correctly or in the same way that I would understand. So then, what happens is there is mistranslations between us (Int. 18).

However, another participant, referring to his business and personal experiences and learning over years, makes an effort to understand the client as much as possible or lets them express themselves more clearly:

> Everything that I share with our clients comes from that core understanding. There is an enormous learning curve. My questions are based around that core experience. I guess those questions are always developing, growing and changing as our experience grows. We need to meet more complex customer needs and understand the limitation in "what someone who is inexperienced is going to perceive". I try to ask the right questions; the thing that they are never going to tell you to do; because they don't even know or think that way. In the questions, I'm thinking ahead such as their target market, their problems, their calls-to-action, their marketing, asking all those questions right at the beginning (Int. 20).

Therefore, the communication for gathering the required data could be a one-way, defective relationship, or a two-way, productive relationship in which the needs and ultimate message of the client are well elaborated. Some participants like the participant below associate the latter with educating the client:

> As consultants, our job is a two-way street. We get information from the client, but we also have to try to educate the client; so then they can make the best decision for themselves (Int. 5).

In line with two-way communication, web professionals need to be equipped with a set of "soft skills" for driving the communication process in a productive way. The quote below illustrates this:

> These are maybe the soft skills that … make you a good web designer. … The client may not even know how to ask or may not even know what they want. You have to figure out how to tease it out of them. Get them to answer your questions; even if the questions may not make any sense to the client. [It is] applying your own judgment: figuring out what's actually an issue and what's not an issue. The client is very busy as well; so, you have to make effective use of your time with the client (Int. 5).

After starting to build the website based on the gathered information during the communication process, web professionals' use of information continues to be experienced in the form of constantly refining their understanding of the client's need and trying to maintain a level of agreement between what they are doing and what the client means. This is a form of experience in which the client's feedback (a form of information introduced in the dimension of variation of information) is used. Web professionals use different tools or technologies for dealing with information in this form of information use. For instance, the web professional below mentioned Agile technology as a tool and described how he used it to handle the information gained during the process:

> Even for a six months project, every week or even every day, we may have a quick meeting … saying "what we did yesterday, what we are doing today, here's what you can see a demonstration of the website." The client is guiding every step of the way. … We have a very tight feedback loop; so, at the end of the project, there are no surprises (Int. 5).

As was mentioned prior to this, information use in this category is experienced as developing an understanding of the client's requirements and needs. Therefore, not only communicating with the client per se, but also any other efforts by the web professional that result in such understanding could be considered as information use in this sub-category. For instance, "reviewing online forums" (Int. 13) is an activity to get more knowledge about clients, however indirectly and independent of the clients themselves.

In this sub-category, the continuity of information use is limited in comparison to the previous category. That is, the act of information use here continues through building, delivering and maintaining a whole project. Therefore, while in Category 1: Staying informed web professional's engagement with information could be a continuous act throughout their career life, this act is mainly situational and therefore limited to some extent in this sub-category and its general category. The act of information use launches with starting to communicate with the clients and ends with delivering the website. The quote below shows this limited timeframe:

> So, in a period of four months, we were able to build a very sophisticated geospatial website (Int. 5).

This process may repeat frequently, for every new project that the web professional becomes involved in. However, it should be noted that when web professionals use information such as a client's new updates for refining an existing website, the continuity of information engagement may not be limited to the end of the project. That is, information engagement may last for a longer time and even through the life of the website. The quote below describes how new updates from the client extend the web professional's engagement with information:

> I get his actual email approval to say: "Yes, it's fine, put it live." Then I'll put it live and then he usually pays the bill. So, I know he is happy from there. He also contacts me every three months with a new project to update everything. So, it's an ongoing job anyway (Int. 14).

Information use (Sub-category 2-B: Making users satisfied): Information use in this sub-category is very similar to information use in Sub-category 2-A. The act of information use here again is seen as web professionals' efforts to gain a good understanding of one of the parties involved in the website building project: the users.

In this sub-category, web professionals' act of information use happens at different stages of building a website and through using different methods they collect, use and study user-related information to develop their understanding of their target group. Similar to Sub-category 2-A, the most important form of the act of developing an image of users in this sub-category is collecting information about groups of users.

Web professionals gather user-related information from different sources. In addition to obtaining the general idea of the target market (i.e. users) from the project requirements, web professionals also undertook research to become familiar with the group of users. That is, although they may know for whom they are building a website, they may not have a clear

idea of the characteristics of that group. Therefore, as in the quote below, they do some research to become aware of these characteristics:

> I was recently asked to design something that was an appeal to youth and young adults; ... I spent a lot of time looking at "what other brands does that group interact with?" They were "Apple" and "Coke". And … "how they talk to them?" I'll be constantly assessing those experiences and asking them- or if [I can] I try to find some people in that group- to tell me what it is they like and don't like about something (Int. 14).

Web professionals may also study users' viewpoints and feedback about the website, and based on the attained information refine the website. The quote below shows how a web professional let feedback obtained from users lead him in refining his website:

> You can put your website out there and let the users tell you [about it]. You listen to their feedback and give them plenty of opportunities: "Tell us what you think!" There are some that would say: "Oh! That's great! Don't worry!" And some would say: "You know what? I couldn't use it on this phone." And I go: "Cool! Thank you!" That's getting users to scientifically test it (Int. 17).

The act of developing an understanding of users can occur at different stages of the building process. That is, not only for launching a website project, but also through and after building a website, web professionals deal with user-related information and further develop their preliminary image of users. At all these stages, they gather information about users and their thoughts through different tools such as user tests and web tracking systems. Examples of both tools are shown below:

> In the redesign or design process, we'll set up personas. They are fictitious people that we think our users are. For a library here, we might create Bob. … Bob is a 40-year old famous researcher who leaves in New South Wales and has a moderate internet connection [and etc.]. ... We can go out and find real-life people that match those personas and you test it to see: "Is this working? Is this what you really expect? Will this satisfy your needs?" (Int. 15).

> We've got this marvellous thing called "Google Urchin Analytics" which lets … me know what browsers they [users] are using. So, I know whether I've got to worry about stupid old Internet Explorer- which is the worst browser on earth. [It] breaks and it's terrible- or whether I can design in Safari and Firefox which are very good browsers (Int. 23).

The feature of information use continuity here is very similar to what is experienced in Sub-category 2-A. Information use again in this sub-category continues throughout a whole project of building, delivering and maintaining a website. This limited experience is comparable to the duration of information use in Category 1, where the web professional can experience the act in a career-lifetime mode. However, it is interesting to note that when applying users' feedback regularly in order to refine an existing website, the limits of the experience span beyond the construction timeframe of a website. Additionally, similar to

Sub-category 2-A, the web professional can repeat the act of information use frequently, when launching every new project.

Information use (Sub-category 2-C: Building a seamless website): The act of information use in this sub-category involves web professionals' efforts to meet his/her own expectations in terms of building and maintaining a seamless website. This effort includes all activities that web professionals engage in to ensure the website works perfectly. An example of these activities is shown in the quote below:

> I'll be checking the statistics on that website regularly … I'll also make sure it turns up in searches. I constantly check, go back and look at it at various times just to make sure it's still working the way it should and they haven't throw it off (Int. 14).

The obvious outcome of such practice is a seamless website that continues its life with a minimum of bugs and errors interrupting its functionality. However, as was emphasised prior to this, it is the activities per se that constitute the information use.

Web professionals' activities include testing the system actively and regularly to recognise probable bugs and errors, and not ignoring them but also paying attention to them. The web professional in the quote below mentions regular testing for maintaining the proper functionality of the website:

> The testing is just to see whether something is broken or not. I mean making a change gives a good chance that might break something that was fixed ages ago. So, we constantly have to run little tests. It's the least you can do (Int. 17).

Such proactive practice is in contrast with another approach to dealing with this type of information (i.e. bugs and errors), in which web professionals ignore the errors they encounter. From the perspective of this research, this is interpreted as not using the relevant information when required. The quote below is an example. It demonstrates a situation where some web professionals ignore information they are encountering:

> Some people are like: "I'll just steal all those code, mash it together and then I've got my website." Then, when something goes wrong, they are like: "Oh! Why and how did this go wrong? Well, Forget it. I just leave it. They won't notice." Then, of course somebody does notice. Then they say: "Why didn't you fix that?" And they say: "I just have no idea" (Int. 12).

As is observable in the quote above, the results of such an approach is a website that will experience technical issues in the future. However, this is not a subject matter for the act of information use, but the outcome of such act.

The feature of continuity of the act of information use in this sub-category shares commonalities with the other two sub-categories. That is, experiencing information use here again continues through building, delivering and maintaining a website. Similar to the other two sub-categories, however, it can continue through the lifetime of a project when the web professional is involved in the maintenance practice as well. Additionally, the act is repeated with launching every new project.

Summary

Table 4-2 provides a summary of Category 2, where effective use of information is experienced as building a successful website.

Table 4-2 Summary of Category 2: Building a successful website

Category 2: Building a Successful Website		
Key quote	-	
Meaning	Effective use of information is experienced as building a successful website. This type of website delivers the client's message to the user via a seamless system.	
Focus	Building a successful website	
Sub-category 2-A: Making the client happy		
Key quote	*[For an example of effective use of information] I think I am going to go back to the requirements document that is the single most important document of information that lists out everything that is needed, everything that is going to be needed, everything that is expected and everything that needs to be delivered in the end. In the end, it all boils down to what was in the client's requirements. That's what my work is based off of (Int. 5).*	
Meaning	Effective use of information is experienced as building a website which meets client's needs and requirements.	
Structure of Awareness	Focus	Client
	Background	Web professional's own role
	Margin	Community of practice
Dimension of Variation		
Information		Project requirements
Information use		Developing an understanding of a client's requirements and translating them to a website
Sub-category 2-B: Making users satisfied		
Key quote	*Depending on how many, what the **customers** [i.e. users] are and who we are talking to, I'll be looking at those sites that those people tend to be looking at. [I'll] be looking for what elements make it inviting to that group of people (Int. 14).*	
Meaning	Effective use of information is experienced as building a website based upon groups of users' characteristics.	
Structure of Awareness	Focus	Users
	Background	Client
	Margin	Taking part in the community of practice
Dimension of Variation		
Information		User population's characteristics
Information use		Developing an understanding about the users
Sub-category 2-C: Building a seamless website		
Key quote	*It's very hard to say that [i.e. information use] is effective, unless they tested it [i.e. the website] against five different other ways and found out which is the most effective way [of using information]. ... If you wanted to know if your way was effective or not, the only real way to do it is to test it. I recommend we do this, but I can't tell you if it's effective, unless we test it again, see the alternatives and do a control test (Int. 17).*	
Meaning	Effective use of information is experienced as building a website based upon web professional's expectations of seamlessness.	
Structure of Awareness	Focus	Website
	Background	Client, Users, community of practice
	Margin	Staying informed
Dimension of Variation		
Information		Side effects (e.g. bugs and errors)
Information use		Doing activities to ensure that the website functions seamlessly

Category 3: Solving a Problem

Meaning:

For Category 3: Solving a problem, effective use of information is experienced as solving a problem. In this category, a problem could appear at three levels. At a micro-level, it involves locating technical issues that have one specific solution. At a meso-level, there exist broader problematic situations which require a skill or a higher level of knowledge that the web professional lacks. Finally, at a macro-level, there are situations that need a decision to be made about handling them prior to gaining a technical solution or learning a new skill. As a result of effective use of information, a technical problem is resolved, a new skill is learnt or a piece of knowledge is obtained to overcome a situation, or an informed decision is made. The following quotes illustrate the meaning associated with this experience, at each level from micro to macro:

> If you talk about information literacy, I think web designers are mostly quite literate. They have developed skills on how to find best information out there to solve their problems (Int. 4).

> I hadn't really thought much about it until I was asked to perform a usability test for a software company I was working with about 3 years ago. I went and bought 3 books on the subject. ... I also used a website called Usability.gov. ... It has wonderful documentation; examples that are available to download as far as preparation forms and analysis and things. I just read and read and read. I think I probably watched some videos of people's usability tests that they had posted. Then, we just did it (Int. 19).

> Effective use of information is when can actually learn something from it. You are not just going on a hunch. You are actually making an informed decision (Int. 15).

Structure of Awareness:

Focus: In this category, a significant amount of attention is directed towards solving a problematic situation. In the web professional's view, available information or information resources are used effectively only if the problem he/she is encountering and using information for is resolved. This is the steady part in their conscious awareness, which is not related to the dimensions of the problem. However, when the dimensions of the problem are taken into consideration, a variation towards the solution is observable in their focal point of awareness. That is, the solution they reach could be a piece of technical information, a new learnt skill or obtained knowledge, or an informed decision, which constitute the varying part of their focal point of awareness. The focus of this experience towards solving a problem is illustrated by the following quotation:

> If the client comes along and says: "I've seen a really great website where if you just mouse over this small image, it automatically comes up a bigger size to the right…" As the web designer, I'm thinking "I have no idea how to do this!" But I've seen it on a website. So, I go to that website and I click on source code, find the source code and look at it. If I had more time, I would study the source code of how to do that and then go and talk to somebody who is in the design world now and say: "Look! What is this all about? What is this source code?" They would have to translate it for me; because I don't understand any more what this particular function is and how it is achieved. … I would have to go and solve it. I would have to go and find the information. If I was doing that now, I would have a network of experts around me. I'd be building relationships with other people in the business at the pub or somewhere. You would have to do that; so, if you did have information resource, you could have access to the information you might need. When you come across to something that you don't know, you have to go and find out it (Int. 8).

Background: When web professionals experience effective use of information as solving a problem, their main focus is on finding a solution to that problem using information resources. Although web professionals in this category are aware of the role of information resources in their experience, different types of resources or associated themes are located in the background of their awareness. In every problem solving case and depending on the type of the problem, the web professional then draws one of these sources or themes into their conscious awareness to find the solution. The most important source of information for the interviewees of this research was stated as being the community of practice. Therefore, although having a strong focus on finding a solution to their problem, they always keep the value of the community of practice in the immediate context that is surrounding their focal point of awareness. Additionally, in the background of awareness in this category is the value of keeping current about available information resources. This state of being informed could make the problem solving a smoother process. There are also signs of being vaguely aware of the value of information organisation when dealing with problematic situations, which is mentioned as building and maintaining a knowledge base, in the background of awareness.

Margin: As mentioned above, the distinguishing feature of this category is solving a problem. This is what happens constantly while constructing a website. Web professionals constantly encounter various problematic situations that need to be handled. The handling of these situations is of such great importance that web professionals rarely pay attention to the success of the whole website from the viewpoint of the client or users. Therefore, their experience of the phenomenon as building a successful website recedes into the margin of their structure of awareness. Moreover, although web professionals value the role of community of practice in problem solving situations, this is only in terms of taking the information from the community and not contributing to the community. Therefore, it is

concluded that information giving which is only one of the elements of their awareness of the whole community of practice sits in the marginal area of the experience in this sub-category.

Dimensions of Variation

As was mentioned previously, Category 3: Solving a problem has two dimensions of variation: "information" and "information use", which are outlined below.

Information: The dimension of variation of information in this category is mainly characterised by a solution used to solve a problem. However, web professionals in this category make a close connection between information and source of information. That is, they sometimes characterise the solution (i.e. information) according to the origin of the solution (i.e. information resources).

> This is solving the problem, solving all the technical issues, figuring out where to find the information (Int. 5).

As was mentioned earlier, a problem in this category has different dimensions, ranging from a specific technical issue to a situation about which a decision has to be made. For problems at a micro-level, the main source of information (i.e. the problem's solution) for web professionals is their community of practice which could be an online or an offline community. Online communities of practice include specialised and technical online forums, and the web professional's online network. This community is accessible via the web and is searched through search engines, mainly Google. The offline community is comprised of colleagues in the workplace, regular local gatherings and so on.

Information in these communities of practice is either implicit or explicit. The explicit information is what is shared within the community and is mostly in the form of past Q&As (in forums, blogs, etc.) to which web professionals could refer. Web professionals might find an exact or a similar problem to their current problem was addressed in the past and they can use it as a piece of information. This explicit information is "out there" and web professionals may be able to search and find it independently. The source code of an existing website is another example of explicit information used in problem solving. The implicit information then is the not-shared knowledge of the members of the community of practice. This type of information is not findable, unless it is requested. Having this in mind, web professionals appear to prefer the most accessible and reliable type of information. The quote below demonstrates this very well:

> The speed [in using the source] is very important. We have limited time for some projects. We should use the fastest and most reliable resource in there. We should see how accessible it is and how fast is access to that and how reliable it is … Using online resources is more effective and it's quicker. Or using offline resources that are very close to you such as your colleagues in the company (Int. 13).

Therefore, at a micro-level, in a quick search for the solution, web professionals may prefer to either review the past but relevant Q&As that are already accessible in forums (explicit information) or ask very close colleagues in the office (easy to access implicit information). If still in need of an answer, their second option is posing their question to the community and waiting for an answer (i.e. request for implicit information). In these cases, being proactive has been mentioned as an important factor in finding the solution:

> The thing is that you can't just sit back and be like: "Oh! Somebody will pop up and help me." You have to be proactive. You can post it and be like: "Ok! I put the question out there, but I'll continue looking and looking and looking." … There are times that people have not got back to me but I continued to go on and searched the internet for answers (Int. 12).

At a meso-level of problem solving, the problematic situation is that the web professionals lack a specific skill or knowledge. In these situations, the solution will be learning that particular skill or obtaining that knowledge. For learning a new skill or obtaining a piece of knowledge, web professionals look in books, but mainly use online tutorials, training videos or the software manual. This again shows the community of practice as the key source of information for dealing with this type of problem.

The fact that books (and, in general, print resources) are not often updated is introduced as a big barrier by web professionals in taking advantage of these resources. This issue that was mentioned in Sub-category 1-A: Keeping current is still of importance in this category. The quote below is indicating this:

> Until the book is written, content is sometimes out dated. Once it's published, and once the local library has acquired a book it passes a year. And a year in the web development is like a million years in the real world. Stuff that's cool today, it's out dated tomorrow. So, for that sort of stuff, the web and specially forums and blogs where people interact in real time and help each other in real time on problems is much more effective (Int. 4).

However, currency can be a consideration for using online resources as well:

> I find with a lot of the web tutorials there, I only use them if they are under 12 months old. If they are any older, I don't see them as relevant anymore, because they're changing styles. Standards are changing (Int. 7).

The other element mentioned as a characteristic of information important for learning a new skill or finding knowledge is the quality of transferability, which is rooted in the format

of the information. One participant believed that video was more accessible than text in transferring information and a combination of both (*multimedia thing*) was even more powerful:

> Video is more accessible and a better way to transfer information than via texts. Then that tool is used by bloggers who write tutorials and mashed it up. In a piece of text, they say "This is what we do!" … Then [there] comes a video which describes what has been done. Then underneath, you find another text and a couple of pictures. It's a bricolage of different formats of information. It's a multimedia thing (Int. 4).

Finally, for problem solving at a macro-level (decision making), web professionals' knowledge and previous experience is the most important type of information. This knowledge and experience is achieved via education, workplace activities and keeping current or simply being in the profession for a while. The two quotes below indicate this:

> As a designer, it's up to me in a way to "Is that a good method? Is that a bad method? Is there a better way of doing it?" Using good knowledge and the experience that you've got from working on the web for a long time … put it in an ordered case for "this is a good way of doing it, this is a bad way of doing it." (Int. 15).

> I did it through course. Because we did a lot of evaluating or what makes a good database. That's how I chose what type of areas I want to focus for my content (Int. 23).

Information use: The dimension of variation of information use in this category is experienced as the act of dealing with information (or information resources) and matching a solution to a problem. The problem, as mentioned earlier, could be a technical issue, a situation that requires a new skill to be learnt, a piece of knowledge to be obtained or a decision to be made.

Earlier, the difference between the experience of information use as an act and the experience of "effective" use of information as an outcome was clarified. That is, the experience of information use for this category of solving a problem is described as the act that web professionals perform in searching to solve their problems, regardless of whether the problem is solved or not. The quote below illustrates a simple information use experience of a web professional. In this case, the web professional experiences information use as engaging with information resources (i.e. training videos) to learn a required skill:

> We had a client who wanted an instructional tutorial like a "how-to" video. ... We decided to use Adobe Captivate, which no one in the company had used before. I spent about two days just watching the training videos and doing the practice and exercises (Int. 19).

The web professional in the quote above eventually learns to make the "how-to" video. This is a resolved situation and therefore a clear experience of the phenomenon under

investigation. However, what is important here from the quote above (and in all other places discussing the dimension of variation of information use) is the act of using information and not the outcome of it.

In this study, two phases for the experience of information use have been recognised. The first phase of the act starts with searching and locating information. Participants generally point to online searching, mainly through Google. The quote below is an example:

> I might say: "This is a tricky problem to solve. How do I solve it?" I'll google something and find something. That's how I use information to solve this particular problem (Int. 17).

The example above was related to searching explicit information. However, the information searching act may also happen for implicit types of information. This is when web professionals asked other people in the community, for instance people in online forums, about their problems and gained required information from their minds. The quote below shows how this searching for implicit information occured:

> I would join more forums. ... There's wonderful forums of the people just like you, doing just what you are doing and you would go: "Does anyone know how to do this?" What does this source code mean? Can someone translate it for me?" And you'd get your answer (Int. 8).

Knowing different information resources to search helps this searching phase of the experience to end in an outcome. A previous quote that mentions "having a network of experts around" (Int. 8) and the following quote that mentions "knowing other resources than Google" both indicate this:

> Sometimes you look after something, you just see "ok! Google is not providing it; so it doesn't exist!" I'm not sure if that's true. Sometimes stuff exists; but it's not on Google. … I think Google became equivalent of what's available at the internet, but it's really not. Sometimes it's actually worthwhile knowing other resources than just Google (Int. 4).

The second phase of the information use act involves considering the search results gained from the previous phase. This is when the web professional engages with attained information or information resources and browses them for the solution. Watching training videos in a previous example, reading a software manual (Int. 8), exploring question and answer threads in online forums (Int. 4) or having a conversation with someone about the problem (Int. 17) are all examples of this second phase of the information use experience. The quote below demonstrates the exploration process:

> You type into the Google and … sometimes also forums pop up where this stuff is being discussed. Forums are great things. Someone comes up with a question; two weeks later someone responds; month later [another response and etc.] This documentation of people collaborating, not necessarily at one stage becomes a document of people cross posting answers and questions

> or answers to one's questions. ... It's like a couple of web pages you just get forward and forward and forward and in ten minutes you get the entire notion of specific answers that people give to one guy's question (Int. 4).

There is also a small filtering phase that sometimes appears at different stages of the act of information use. Some web professionals mention filtering information as part of their information use experience. According to some of the interviewed web professionals, they may use criteria for choosing a specific piece of information (or information resources), such as the reliability, accessibility or currency of the information resource. For instance, in the quote below, the web professional considers the reliability criterion of information resources when searching for needed information:

> When I was searching for my need in Google, because this site was high-ranking in Google, I saw it, selected it, clicked on it and found what I needed in that site. But, a friend of mine who is in the industry for 10 years now, also introduced it to me. He has been in the industry far longer than me. So, when he told me about that site, I almost knew it could be a reliable resource (Int. 13).

In this category (i.e. Solving a problem), the act of information use has a clear beginning and end. This is an act which is situational and ends with solving the problem. Therefore, as soon as the solution to a technical problem is found, the required skill is learnt, a level of knowledge is attained or a decision is made, the information engagement act comes to an end. The quote below shows the end of the act very clearly:

> A technical problem is usually very obvious if you've solved it. If you are noticing a problem, you're getting some error message or some functionality is broken, something is not working. So, it's very obvious when you've solved it (Int. 5).

Below is another example in which the participant explicitly mentions the end of the act of information use, which has been gaining a new skill:

> We decided to use Adobe Captivate which no one in the company had used before. ... By the end of the week, I was able to make a 6-minute chapter "how-to" video for the client using the software (Int. 19).

As was mentioned previously, information use in Category 2: Building a successful website generally is a situational act experienced during a website project, which then frequently repeats from project to project over the web professional's career life. Similarly, the act of information use in this category is situational for a single encountered problem, which can occur frequently from problem to problem over a project.

> My last case was [finding] the best way of compressing websites. ... I couldn't find my answer in online environment. So, I asked in these forums and people out there answered my question. Generally, I would start from my offline environment and it continues to online environment and if not found there, it goes into these forums. However, it's mostly probable that the question has been answered before. You should go and read them (Int. 13).

Summary

Table 4-3 provides a summary of Category 3, where effective use of information is experienced as solving a problem.

Table 54-3 Summary of Category 3: Solving a problem

Category 3: Solving a Problem		
Key quote	*If you talk about information literacy, I think web designers are mostly quite literate. They have developed skills on how to find best information out there to solve their problems (Int. 4).*	
Meaning	Effective use of information is experienced as solving a problem in three levels: Solving a technical issue, learning a new skill and making an informed decision.	
Structure of Awareness	Focus	Solving a problematic situation
	Background	Information resources (e.g. community of practice), Staying Informed
	Margin	Building a client- and user-oriented successful website, Information giving
Dimension of Variation		
Information		A solution gained from different information resources
Information use		Dealing with information to match a solution to a problem

Category 4: Participating in a Community of Practice

Meaning:

For Category 4: Participating in a community of practice, effective use of information is experienced as being part of a learning community of practice. This includes an information give and take cyclical practice in which web professionals share their knowledge with each other. In such practice, some offer their knowledge to others and some use knowledge offered by others. The whole practice enables the industry to go forward and make advances. On a smaller scale, it lets individual professionals deliver a successful project within their team. This way of using information is "the key to making a better web" (Int. 18) as explained below:

> Pretty much, most frameworks are not developed by one person. It's really usually developed by community of volunteers ... who have an idea of what they want to do. They make these frameworks and then release them to public to use. The public gets all of it. If it's really a good tool, more people are doing it and they try to make the framework or the tool better and more robust than before; either through extensions or plug-ins. That's really the key to making a better web; everyone is contributing to making your programmes better (Int. 18).

> All of these interactions really help to spread ideas and ways of making things more efficient (Int. 24).

Focus:

The primary focus of awareness in this category is on information sharing (in the sense of information giving and information taking) within the community of practice.

> Sometimes these things go open source, which is very very nice; because you don't need to reinvent the wheel over and over again. There are people who are just very very brilliant. They design colours and make things nice and just open source it. So, you just grab stuff, combine it with something else and BAM! You have your own website! It is how you imagined the website to be, but you used different people's code. If you come up with something that is new- not anyone else has done- you just open source it as well. You create a website that is a mash-up of all best practices from the individual elements that other people use. I think this collaborative process of creating, sharing, coming up with new things is just a win-win situation for everyone (Int. 4).

Similar to the previous categories, the focus of awareness in this category is constituted of a stable part and varied parts. That is, while the idea of information sharing stays stable in the centre of awareness of this category, two aspects of it (i.e. information giving and information taking) divide it into two secondary focal points of awareness. Based on these variant aspects, two sub-categories are recognised that are discussed below in terms of their referential aspect and structural aspect.

Sub-category 4-A: Information Giving

Meaning:

Effective use of information is experienced as contributing to a community of practice. This includes offering what web professionals know, have achieved, discovered or developed as well as all their "little special talent" (Int. 8) and skills with the rest of the community of practice, for the benefit of all and in order to advance the industry. "Information giving" is the sub-experience of the broader "information sharing" experience.

> Underneath the video on YouTube, we have discussion -"Oh mate! You used that? Why don't you use this tool?" -"well... that's a good point!" And someone else creates a response video referring to the first video -"well... that's a good technique, but this is how you actually do it better". It's not a competition; but it's sort of connected videos that discuss a particular topic and sort of collaboration comes up to a solution which works best. The solution is then accepted by their community as sort of model to go with (Int. 4).

Structure of Awareness:

Focus: Information giving is the distinguishing feature of this sub-category. That is, the most important element of this sub-category is contributing to the community of practice by feeding the community with the knowledge that the web professional possesses.

> There were not many tutorials [about issue X] out there and I found it very difficult to find how to do it. But once I figured out, I wrote a tutorial about that… People didn't know how to do that. It was sharing the information with others (Int. 7).

> being the fan of the open web. It's nice to give back and help out. It does make you feel better (Int. 12).

It should be noted that in the first quote above, "sharing the information" is taken as the meaning of "giving the information" which is the focus of this sub-category.

Data analysis revealed that the two sub-categories of the broader category (i.e. participating in a community of practice) are only different in their focal points of awareness (and not in their background and margin). Therefore, in this thesis only the focus of awareness for these two sub-categories is discussed separately and the discussion about the background and margin of these two sub-categories considers them together.

Sub-category 4-B: Information Taking

Meaning:

Effective use of information is experienced as using collective intelligence, best practices (and also avoiding using worst practices) and packed practices offered within the community of practice. Web professionals who see themselves as part of a learning community of practice value these collective intelligence and best practices as the key knowledge product (end information-product) of the community. As a consequence, due to the credit, collective formation and wide acceptance of this knowledge among the community, web professionals consider use of this quality information as an effective way of using information. "Information taking" is the sub-experience of the broader "information sharing" experience.

> First time I heard about jQuery was when I went to a website. There was a couple of nice screenshots of what it did. That's the first point that I get the idea of what it does. But then you also start looking for people who have used jQuery... Then you see it's a big community of people discussing this stuff. Having this community as a back-up makes you think "Ok! If other people use it and are heavily engaged in discussions and post examples of what they've done with jQuery" you see the opportunity that jQuery as a channel gives as a democratic voice. So, if there are piles of posts that tell you about jQuery, how good it is and how effective it is, I can trust into jQuery. Having this collective intelligence of people who evaluate information is good. You see for anything that has been done in a good way, there are always one or two tutorials that describe it in a very very precise and good way. ... And if you know it's been liked 273 times of the last two months, then you get a feeling: "Many people have found that useful before, so it's probably a good piece of information" (Int. 4).

Structure of Awareness:

Focus: Information taking is the primary feature of this sub-category. That is, the key element within the structure of awareness of web professionals is using information offered by the community of practice. The main feature of this information is its collective formation and wide acceptance as well as accuracy among the community.

> There is no use reinventing the wheel like building everything from scratch. If there are people out there, they can help. They can get things done a lot quicker plus it's more secure. It's been tested (Int. 7).

Background: The important feature of this category and both sub-categories is information sharing, whether it be taking information from or giving it to the community of practice. Therefore, information sharing sits just in the focus of awareness of this category. Experiencing effective use of information as problem solving, building a successful website for the client or users, or staying informed are located in the background of awareness of this

main experience. For instance, information taking normally is done with the purpose of solving problems. However, what makes it different from Category 3: Problem solving is the emphasis of web professionals on the quality and nature of the information in this category (e.g. collective intelligence, best practices, packed practices). That is, instead of focusing on a solution to the problem (as in Category 3), web professionals tend to talk about the quality of the information they are using. Therefore, although it accompanies information sharing, problem solving sits in the background of awareness. Similarly, web professionals take users vaguely into consideration when using best practices, that again keeps this element in the area that surrounds the focal point of awareness.

Keeping current is another element traceable in the background of awareness of this described experience. Although web professionals' total focus in this category is on participating with a sharing and contributing culture, a consequence of this type of experience will be staying informed of industry advances, which therefore pushes this experience into the background of awareness. An example is indicated in the quote below where the web professional who takes part in a willing-to-share community receives updates about the industry from peers:

> I'll usually have some sort of discussion with my other designer friends. At some point we get together and ask each other: "Have you seen this? … I thought this really worked." I guess there is always that checking with my peers (Int. 14).

Margin: As was seen above, web professionals that experience effective use of information as participating in a community of practice are quite aware of most of the important discussed elements associated with the effective use of information in designing and developing websites. This might be related to their expanded view towards the whole industry and the practices involved. Therefore, there is a high likelihood that no related element is out of their centre of awareness.

Dimensions of Variation

As was mentioned previously, Category 4: Participating in a community of practice has two dimensions of variation: "information" and "information use", which are outlined below.

Information: The dimension of variation of information in the category of participating in a community of practice is characterised differently due to the attendance of

various distinguishing features of awareness. The dimension of variation of information is therefore discussed separately for each sub-category below.

Information (Sub-category 4-A: Information giving): In this sub-category, information is mainly characterised by web professionals' internal knowledge. This type of information is transferred from an individual to others. This is a relationship between the web professional on one hand, who is willing to offer his knowledge, and the community of practice on the other hand, which receives the knowledge. This relationship is discussed in detail later when describing the information use for this sub-category. In the quote below, where a participant describes her experience of this type of information (i.e. given information), both parties (i.e. the web professional and her colleague) are givers. Moreover, the context of the experience is a small team of design and development, and not the broader community of practice. The quote also shows a productive information sharing relationship between two groups of web professionals: designers and developers:

> At my previous job, we're getting a lot of knowledge from each other. I would have more of the interface and design perspective and the developer would have more of a code and functionality perspective. … We hashed through things a lot and discussed approaches. That's really really useful (Int. 19).

The information in this sub-category comes from different sources (or givers). One source of information is key actors or informants within the industry. They are experts or specialised organisations that play a leading role within the industry and are mainly experienced in one aspect of website design and development, such as Jakob Nielsen in the area of usability (Int. 4) or The Information Architecture Institute (Int. 23) in the area of information architecture. Along with them, there are also "deep thinkers" (Int. 4), "knowledgeable and experienced people" (Int. 24) and "experts" (Int. 7) that put their personal knowledge and achievements "out there" (Int. 4) for the rest of the community to use. The information offered by this group of individuals and organisations may then be considered as "clear fact" (Int. 4) or best practice within the field and is followed by other community members (i.e. information takers) to guarantee their effective use of information. It is interesting to note that this is one type of information also experienced by participants in Sub-category 4-B: Information taking.

Not many of the participants in the current research were producers of this type of information. Therefore, no direct quote from such an individual is available in the research data. However, many participants in their interviews considered such professionals

positively, and cited their sharable internal experience and knowledge as one type of information in this sub-category. For instance, one participant noted a fact in the website design field: "the best design goes unnoticed" (Int. 12). When the interviewer asked him about the source of the fact, he mentioned two informants (or information givers) in a specific area that he follows. Here, the knowledge that the two information givers offer to the community with the purpose of "paving the way" for others is the experienced information in this sub-category:

> Jeffery Zelman is a standards evangelist. He is all about proper coding or code standards. When you are scripting, you say stuff like "Don't mix in your JavaScript with your HTML! It looks crappy. It's hard to read. It breaks the web." By break the web, I mean slowing it down and conflicting with it. ... Ethan Marcotte is a standards evangelist as well. He designs and mostly develops. He's about the same. Both of them really push for the standardisation of code. They're sort of the "Grand Daddies of the web". They had to live through the whole horrible Internet Explorer 5,6 and 7. They paved the way for us young bucks (Int. 12).

Other information givers are individuals working within the field who see value in helping other individuals with whatever knowledge that they have. The participant below sees this as paying forward (instead of paying back) and probably as a responsibility towards the community of practice:

> It's nice to have someone that is there that you can turn into and say: "I'm trying to do these things. I've blocked here, here and here. Can you give me a hint?" … They say: "Ok! Let's take a look and ..." It's really humbling and nice. Since it happened to me and the experience has been very positive and helpful, helping somebody else is my best way that I can pay it forward. It just feels so good (Int. 12).

The function of the information in the example above is solving a problem of one member of the community of practice. However, the information given by individuals also can have a contributing function associated with the whole community of practice. In this sense, what the individual gives to the community leads to an advancement or a solution to a common problem within the field. Information that individuals give in these situations is like a block that is being used along with other information blocks to construct solutions or lead to advances. For instance, the quote below demonstrates how information giving allows members of the community of practice to work together for a solution to a common issue:

> Everyone is trying to comply with standard and actually build up on that. You would have heard a lot of people hate IE7, because it's not up to the industry standards. The community talks about their experiences and how they can get around. ... You've got the community saying: "Hey! This is how I overcome this problem! You can do it too." Cause with, for example, IE with Microsoft, they don't tell you how to solve it. They just go "This is what we've got. Figure it out."(Int. 7).

Information (Sub-category 4-B: Information taking): In this sub-category, information is mainly characterised by reliable and quality knowledge products of the community of practice. Regarding the earlier mentioned relationship of give-take, but from the opposite direction, the taker uses what is offered by the giver, which is the giver's internal information and knowledge. Therefore, within a community of practice with many givers, the taker takes advantage of the information and knowledge offered by the whole community of practice. However, he/she is also sensitive to the reliability and quality of the information that is to be used.

Information may be experienced as collective intelligence in this sub-category. Collective intelligence is the outcome of the collaborative thinking and practices of the community of practice concerning a problem. In a simple sense, web professionals rely on a consensus in practices of the members of the community of practice. The quote below demonstrates this:

> Sometimes [you're] trying to make a decision if a client is asking you something in particular and my research is trying to get a consensus of what people have tested and found to be effective (Int. 19).

In this regard and from an opposite view, a participant explains that when enough evidence does not exist on collective acceptance of a piece of information, there remains a chance that it may not be used extensively:

> People feel safer knowing that it's got the history. In my experience, if it's brand new, people might be reluctant to use it or they'll have a lot of questions which they can't go out (Int. 7).

In another form, information may be experienced as best practice. These are facts and sets of rules that are established or confirmed by experts and experienced people within the field of practice. Jakob Nielsen's guidelines in the area of usability is one example of best practice in the perspective of one of the interviewed web professionals:

> There are guidelines, for example the Nielsen web guidelines. Think things not to do, think things to do. It can be quite specific things like "never use more than seven bullet points as a structure; because if you use more, it doesn't really matter. People's short term memory just does seven things" … So if you learn and know such things, you would never implement them. … Stuff like that which is just clear facts. If you develop them, if you know them, then you won't make these mistakes (Int. 4).

Best practices may be the result and outcome of experience and research practices of these experts over time. The quote below indicates how the rule about setting the layout of a webpage is formed based on extensive user testing:

> With a lot of user testing, they've [i.e. experts] discovered that people feel confident if they go to the websites and for example, a logo lines up with the first header that lines up with the paragraph underneath and etc. (Int. 2).

In addition to sets of abstract rules, best practices can become visualised in the form of well built websites, when applied practically. "Award winning websites" (Int. 8, Int. 14) or websites "with ideas of what would work" (Int. 23) are examples of best practices. Best practices applied in these kinds of websites are more tangible and understandable for web professionals in comparison to the set of rules published in the community of practice. It should be acknowledged here that participants never explicitly mentioned a preference of well built websites over sets of rules. However, this can be concluded because of the considerable amount of times that the former were mentioned in comparison to the latter. That is, there were many places in the data where the participants conveyed the meaning of the quote below:

> In terms of information, I like to learn from best practices. Certain websites are just working in a specific context. You can just analyse what works very well and if you go through a lot of examples, you build up this repository of things that just work in a specific context. That will help you to determine what sort of interact of elements or features you can include in your website to make it work as well (Int. 4).

There is also another form of information experienced in this sub-category, which is packed practices. Packed practices are mainly ready-to-use coded functions that are prepared and made available by "nice" (Int. 10) and "brilliant" (Int. 4) givers of the community. A participant explains this in a very simple language:

> JavaScript is very strong. In the past, they used to write the JavaScript code line by line. But now, there are libraries for this purpose. A library is bunch of code. And jQuery is bunch of JavaScript code. So, jQuery uses these libraries. And what are these libraries? A group of nice people has done a great favour; they have written and prepared some code. This means that instead of writing 100 lines, use this word or this line and it's the representative for that 100 lines. So, 100 lines become only one line. And you use these libraries in your website. ... They are all ready and prepared beforehand. You only need to change very minor things in there. It's very difficult and time consuming to write all the code from scratch (Int. 10).

Web developers do not need to develop many things from scratch when they use these packed practices. Therefore, using them makes the development practice much faster and easier. The quote below illustrates this very well:

> There are problems with my code or I may not understand how some third party library works. Somebody may have already written some code that does some function like "Sign On". Instead of doing everything from scratch, we only have to rely upon these tools that already have been developed. We can just download them for free and we can use them for a client (Int. 5).

The participant below describes how time consuming it is when this kind of information is not accessible and they have to do all the coding themselves:

> [My client]'s trying to make the menu sit where it sat and function the way he wanted it to function. It took me a long time. Even though it's a relatively simple clean very uneventful menu, it took me ages to write it. I spent a lot of time on finding the menu code on websites, try to understand [it] and I couldn't find anyone who did it exactly the way I wanted it to be done (Int. 14).

From quotes with similar meaning, the importance of this form of information in building websites can be inferred. According to the data, it is also observable that where exact code (information) is not accessible, similar and relevant code can be beneficial. In these situations, web professionals need to manipulate the information in order to meet their need. The interviewee above, when disappointed by not finding the exact code she needs, decides to use similar code and modify it in a way that is suitable for her website:

> Then when I found something that was close, I was trying to just slowly modify each line of text and put it up and see how that changed and modified it again and see if that changes the way I'd thought it would change it. I'm constantly adjusting something and checking to see whether what I thought was going to happen happened and if it didn't, why didn't it? And then going back and trying something new until you get it to do what you want it to do (Int. 14).

Altogether, collective intelligence, best practices and packed practices are all types of information that are beneficial for web professionals who engage within the community of practice as information takers. These types of information are reliable due to having the support of the community of practice and simplifies the implementation of a website project.

Information use: The dimension of variation of information use in this category is characterised by the act of information sharing that occurs in a give-take relationship between giver(s) and taker(s). However, each side of this relationship is an act itself: the act of information giving and the act of information taking. Therefore, they are discussed separately below.

It should be noted here that as the effective use of information in this category (i.e. information sharing) is experienced as an act, readers might find the description of the dimension of variation of information use similar to the description that was presented for the meaning of the category.

Information use (Sub-category 4-A: Information giving): Similar to the name of this sub-category, web professionals' engagement with information is experienced as an information giving act in a give-take relationship. In such a relationship, the giver offers what he/she possesses, which in terms of an information give-take relationship is the person's

internal information and knowledge. Through this type of act, web professionals make their personal knowledge available for the rest of the community of practice. The ultimate outcome of this engagement is making advancements within the industry, which is not the focus of discussion here. In this regard, the difference between information use and effective use of information is emphasised here again. The focus of discussion here is on the act of using information and not the outcome of that. Therefore, what is meant to be demonstrated in the dimension of information use is web professionals' information engagement in terms of giving to the community, but not necessarily making advancements through their information contribution, which is the core meaning of Sub-category 4-A: Information giving.

With respect to different sources of information in this sub-category, the information giving act occurs in relationships at different levels. This may be in a relationship between an individual/expert and the community, a relationship between two individuals or a relationship between individuals in the community. For instance, the act of information giving of "informants in a specific area" (mentioned as information resources in the dimension of variation of information) occurs in an individual/expert-to-community-level relationship. The quote below is an example of "the giving act" at this level, where experts in one area have offered their knowledge to the whole community of practice through creating libraries of codes:

> In the past, they used to write the JavaScript code line by line. But now, there are libraries for this purpose. … What are these libraries? A group of nice people has done a great favour and written and prepared some code. This means that instead of writing 100 lines, you can use this word or this line and it's the representative for that 100 lines. So, 100 lines become only one line (Int. 10).

The second level of giving act at an individual-to-individual-level is shown by the quote below. In this case, individuals as sources of information use their knowledge to meet the information needs of other individuals:

> You can go through Stack Overflow if you have spare time and answer people's questions (Int. 12).

Finally, the participant below tells of the giving act in a community-to-community-level relationship. As mentioned earlier in discussing the dimension of variation of information, the act of information use of individuals at this level makes sense alongside other individuals' information use act:

> One person gives a solution and the next person makes it more complete. Six months later, another person say: "Guys! Microsoft has added technology X. So, instead of doing it in ten lines, you now can do it with one-line code (Int. 10).

As the act of information giving occurs at different levels, the continuity of this act is varied. That is, when information giving happens at an individual-to-individual level, the act lasts until the end of that interaction (i.e. when the information is delivered to the taker). However, this act is experienced in a continuous mode when givers regularly involve themselves with such relationships or higher level relationships to contribute their knowledge to the broader community. The participant below, for instance, talks about two expert givers that have continued their engagement with information for a long time. The last sentence of this quote shows the outcome of their practice, which indicates that their information engagement (i.e. information use) has been effective:

> They're sort of the "Grand Daddies of the web". They had to live through the whole horrible Internet Explorer 5, 6 and 7. They paved the way for us young bucks (Int. 12).

Information use (Sub-category 4-B: Information taking): In the sub-category of information taking, web professionals' engagement with information is mainly characterised by the act of information taking in an information giving-taking relationship. In such a relationship, the taker consumes the knowledge offered by different givers, including helpful active individuals and experts within the field or the entire community. However, as discussed in the dimension of variation of information, the main characteristic of this knowledge is quality and readiness to use. Therefore, information engagement in terms of information taking includes web professionals following the community of practice and its leaders to gain the quality or ready to use knowledge that they offer. This could be a pure following act (i.e. copying) or only getting inspiration from the offered knowledge. The two quotes below are simple examples of the following act. The first quote demonstrates following as copying the knowledge and the second one shows following as gaining inspiration from the knowledge within the community:

> jQuery was just nice. It was just very good; very well-documented piece of code that you get and just copy-paste on your own codes and adjust (Int. 4).

> All the time, you are teaching yourself by looking at other people's work or taking out those Flash design annuals. You would look at the worst sites of 2009 or the best sites of 2008. All the time, you are gaining information about "What is the fashion? What works and what doesn't [work]? What is "wow"? (Int. 8).

In contrast to Sub-category 4-A, in this sub-category the continuity of information use is limited. The act of information use in this sub-category is purely situational and associates only with a specific case in which the web professional relies only on quality information. In

the sense of continuity, this act is very similar to what is experienced in Category 3: Problem solving.

Summary

Table 4-4 provides a summary of Category 4 where effective use of information is experienced as participating in a community of practice.

Table 4-4 Summary of Category 4: Participating in a community of practice

Category 4: Participating in a Community of Practice		
Key quote	*Pretty much, most frameworks are not developed by one person. It's really usually developed by community of volunteers ... who have an idea of what they want to do. They make these frameworks and then release them to public to use. The public gets all of it. If it's really a good tool, more people are doing it and they try to make the framework or the tool better and more robust than before; either through extensions or plug-ins. That's really the key to making a better web; everyone is contributing to making your programmes better (Int. 18).*	
Meaning	Effective use of information is experienced as being part of a learning community of practice.	
Focus	Information sharing	
Sub-category 4-A: Information Giving		
Key quote	*Underneath the video on YouTube, we have discussion -"Oh mate! You used that? Why don't you use this tool?" -"well... that's a good point!" And someone else creates a response video referring to the first video -"well... that's a good technique, but this is how you actually do it better". It's not a competition; but it's sort of connected videos that discuss a particular topic and sort of collaboration comes up to a solution which works best. The solution is then accepted by their community as sort of model to go with (Int. 4)*	
Meaning	Effective use of information is experienced as contributing to a community of practice.	
Structure of Awareness	Focus	Information giving
	Background	Staying informed, Building a successful website, Problem solving
	Margin	-
Dimension of Variation		
Information		Web professional's internal knowledge
Information use		Making information available to the community of practice
Sub-category 4-B: Information Take		
Key quote	*First time I heard about jQuery was when I went to a website. There was a couple of nice screenshots of what it did. That's the first point that I get the idea of what it does. But then you also start looking for people who have used jQuery... Then you see it's a big community of people discussing this stuff. Having this community as a back-up makes you think "Ok! If other people use it and are heavily engaged in discussions and post examples of what they've done with jQuery" you see the opportunity that jQuery as a channel gives as a democratic voice. So, if there are piles of posts that tell you about jQuery, how good it is and how effective it is, I can trust to jQuery. Having this collective intelligence of people who evaluate information is good. You see for anything that has been done in a good way, there are always one or two tutorials that describe it in a very very precise and good way. ... And if you know it's been liked 273 times of the last two months, then you get a feeling: "Many people have found that useful before, so it's probably a good piece of information" (Int. 4).*	
Meaning	Effective use of information is experienced as using collective intelligence and best practices (and also avoiding using worst practices) offered in the community of practice.	
Structure of Awareness	Focus	Quality information take
	Background	Staying informed, Building a successful website, Problem solving
	Margin	-
Dimension of Variation		
Information		Reliable and quality knowledge products of the community of practice (e.g. collective intelligence, best practices, packed practices)
Information use		Consuming quality information and knowledge made available by the community of practice

4-4 Outcome Space: An Overview

The previous section described all the four categories of description and outlined variation in ways of experiencing effective use of information among web professionals. In the next section, the view across these four categories of description will be considered through discussing the outcome space. This will investigate the relationship between the individual categories of description.

The outcome space of a phenomenon manifests the logical relationships between the categories of description of that phenomenon. This is the pattern of variation across all of the uncovered categories. For the phenomenon of effective use of information experienced by web professionals, four categories of description were identified:

- Category 1: Staying Informed
- Category 2: Building a Successful Website
- Category 3: Problem Solving
- Category 4: Participating in a Community of Practice

An overall perspective of these four categories, along with their constituting elements, is presented in Table 4-5. The overview in this table reveals the relationships between the categories.

As the first step in describing the relationships, the order of the categories of description is considered. Such order is revealed based on the situation in which the experience happens. A careful investigation into the situation of experiencing the phenomenon unfolds that these four categories can be ordered in a way that reflects the general process of web professionals' practice. That is, being a web professional, an individual continuously seek opportunities to stay informed about the ongoing trends within the surrounding information environment (Category 1). They, at some points are engaged in building websites (Category 2). It is in those types of engagements that they encounter different problems (Category 3). In order to solve the problems, they approach the community of practice (Category 4).

The more detailed relationships between the categories of description are reported in terms of the observed pattern in the referential aspect, the structural aspect and the dimensions of variation of the categories. Recall here that the referential aspect is associated with the meaning of each category, the structural aspect is associated with the structure of awareness of each category and the dimensions of variation are associated with the common aspects across all categories of description, that receive different value and characteristics in each category.

Pattern of variation across the meanings of the categories of description

The holistic view of the referential aspect of the four categories of description suggests a patterned change in the scope of individual's effective use of information. In this pattern, the scope of the experience in Category 1: Staying informed is in its maximum expansion. That is, in Category 1, the individuals value the sensitivity towards a broad information environment surrounding them. Moving to Category 2: Building a successful website, the scope of the experience starts to contract where web professionals concentrate on using information for accomplishing a specific task (i.e. building a successful website). In Category 3: Problem solving, the scope of the experience reaches its minimal expansion. This is where in the middle of the specific task of building a website, web professionals encounter individual problematic situations that stimulate them to use information for handling those situations and experience effective use of information as solving a problem. This is the most targeted experience of effective use of information in the four categories of description. The scope of the effective use of information context stretches again in Category 4 to cover a similar context as in Category 1.,. In Sub-category 4-B: Information taking, in an effort to seek quality information to handle their problematic situations, web professionals' awareness extends with their focal point turning to the community of practice. This awareness becomes most expanded when web professionals experience effective use of information as a constructive "giving" practice to the whole community (Sub-category 4-A: Information giving). Considering the community of practice as a source that shapes the information environment, the context of the experience in Category 4 is similar to Category 1: Staying informed. However, the distinguishing feature of the two categories is web professionals' varied focal points of awareness about themselves and the community of practice. That is, in Category 1: Staying Informed, web professionals are mainly focused on capturing information from the information environment for themselves while in Category 4 and particularly in Sub-category 4B, their awareness of information taking is more focused on the

community of practice. In other words, while web professionals are more interested in storing information for their own benefit in Category 1: Staying Informed, they are keen in learning from the collective intelligence existing in the community of practice in Sub-category 4B: Information taking. The variation in the experience scope in the four categories is graphically indicated in Figure 4-2 as a ring shape that narrows in one half and broadens in the other half.

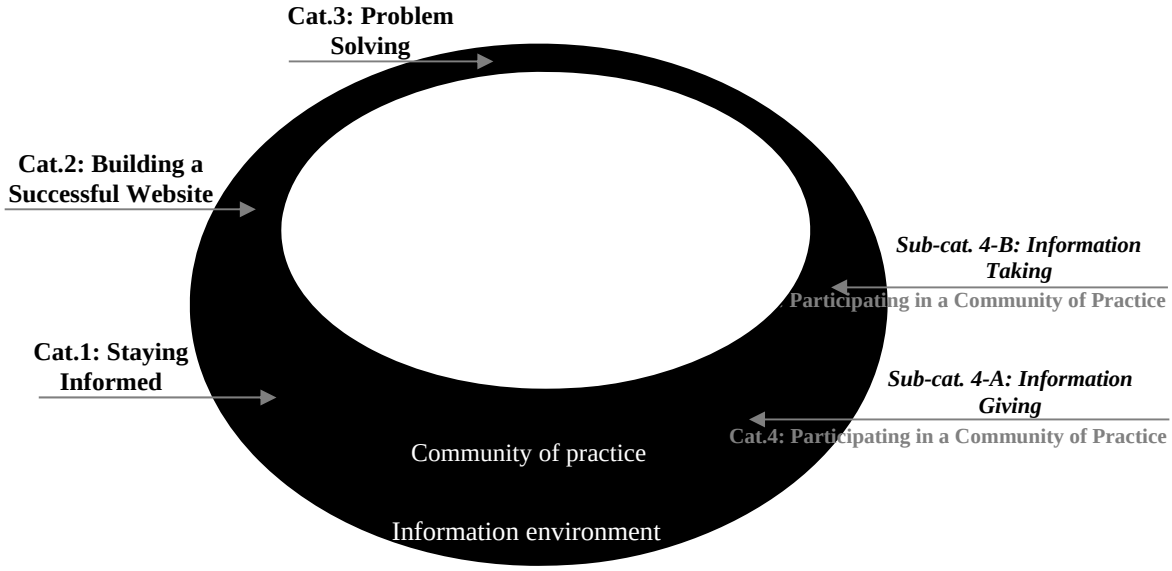

Figure 4-2 The outcome space of the phenomenon of information literacy experienced by web professionals

A more precise look at the way in which the awareness of web professionals changes through these four categories reveals that based on the scope of the experience, the level of engagement of web professionals with the community of practice and information environment differs across the four categories of description. That is, web professionals that have the most comprehensive interaction with the information environment in Category 1: Staying informed, become more focused on the task of building the website, which also involves its stakeholders (i.e. client, users and website itself) in Category 2: Building a successful website. The level of engagement with the information environment and the community of practice is limited in this category compared to Category 1: Staying Informed. Then in Category 3: Solving a problem, when only focused on a specific problem, web professionals have the most limited engagement with the community of practice and information environment. In Sub-category 4-B: Information taking, in order to solve the problem, in pursuing quality information supported by the community of practice and within the information environment, their engagement begins to expand until in Category 4-A: Information giving, the engagement is again in its maximum expanded mode in which web

professionals contribute to the information environment with their information giving practice.

It is noted here that since the level of engagement with the community of practice and information environment is very different in the two sub-categories of Category 4: Participating in a community of practice, these two sub-categories are shown in the diagram and are discussed separately.

It should also be noted that the effective use of information is experienced as a mix of act and outcome. In Categories 1 and 4, web professionals describe effective use of information as constantly keeping themselves informed or involved in a community, which is an act. This is while in Categories 2 and 3, they describe the effective use of information as a solid outcome and in the form of a successful website or a solved problem. As a result, the experience of effective use of information as constant act in Categories 1 and 4 is more expansive than the situations in which it is understood as a solid outcome in Categories 2 and 3.

Pattern of variation across the structure of awareness of the categories of description:

While analysing data and forming the outcome space of the phenomenon, an interesting pattern was observed regarding the changing position of elements across the structure of awareness of different categories. During the analysis, it was observed that most of the time the structure of awareness of the four categories was constituted from elements that were common to all categories, yet which changed their positions across the categories. That is, the elements in the background and margin of one category were focal points in the other three categories of description. This is explained below more precisely.

It was argued that the foci of awareness for the four categories were:

- Being information-aware (Cat. 1: Staying informed)
- Delivering a successful website (Cat. 2: Building a successful website)
- Solving a problematic situation (Cat. 3: Problem solving)
- Sharing Information (Cat. 4: Participating in a community of practice)

In most cases, for each category of description, the three foci (or sub-foci) of the other three categories exist in the structure of awareness of that category, if not in the background, then in the margin of awareness. A good example of this pattern is observable in Category 1:

Staying informed. In this category, in addition to the relevant focal point of awareness of participants (i.e. being information-aware), they are partly aware of problem solving, which is the focal point of awareness in Category 3: Problem solving. There is also some consideration of users in this area of awareness, which relates to experiencing the phenomenon as building successful website (sub-focus of awareness). Then, in the margin of awareness of this category sit the focal points of awareness of two other categories. That is, they never mention the value of information sharing and contributing their own knowledge to the community of practice, which is the focal point of awareness in Category 4: Participating in a community of practice. Similarly, they never consider effective use of information in terms of considering the website project stakeholders such as clients, which is a sub-focal point of awareness in Category 2: Building a successful website).

The pattern is still applicable in Category 2: Building a successful website. While web professionals hold their focus of awareness on delivering a successful website by making their client happy or their users satisfied or building a seamless website, they also more (when turning to making their websites seamless) or less (when only focused on their client/users) value sharing information with the community of practice (Category 4: Participating in a community of practice). However, being information-aware (Category 1: Staying informed) is never in their conscious awareness, which locates the focal point of awareness of one category in the margin of awareness of Category 2.

In the third category, problem solving, the pattern repeats itself. With a sharp focus on solving a problem as the experience of effective use of information, web professionals show a vague awareness of the value of the community of practice as information sources as well as staying information-aware (Category 1: Staying informed), but never indicate that they understand effective use of information as considering client or users of websites they build (Category 2: Building a successful website), which makes the focal point of awareness of Category 2 sit in the margin of awareness of Category 3. Similar to Category 1: Staying informed, knowledge contribution is not valued in this category. Therefore, information giving which is one aspect of information sharing (i.e. the focal point of Category 4) sits in the marginal area of awareness of web professionals in this category.

Finally, in Category 4: Participating in a Community of Practice, the participants seem aware of all the possible ways of experiencing effective use of information. That is, while specifically aware of information sharing, they also somewhat see effective use of information as solving a problem (Category 3: Problem solving), consideration of

client/user/website (Category 2: Building a successful website) or being information-aware (Category 1: Staying informed). That is, the foci of the other three categories are observable in the structure of awareness of Category 4. This pattern can be seen in Table 4-5.

Pattern of variation across the dimensions of variation of the categories of description

A similar pattern of variation to what was observed across the meanings of the categories of description is also observable in individuals' experiences of the dimensions of information and information use. Information, which is experienced as "an occurring broad trend" in the information environment in Category 1: Staying informed, narrows to "client's requirements, users' characteristics and needs or a website's performance" in Category 2. Then, in Category 3: Problem solving, information becomes more specific to an exact solution. Category 4 presents a wider perspective where web professionals see information as quality knowledge and consensus among the community of practice.

The experience of information use follows the same pattern. This experience, which is a process of scanning the whole information environment in Category 1, narrows to developing an understanding of the client's or users' needs for building a website or ensuring the seamlessness of a website in Category 2. This process confines even more to the process of solving a particular problem in Category 3. However, in Category 4, with individuals' engagement with the community of practice, the experience of information use broadens to cover a wider area of practice.

The feature of continuity in using information follows a similar pattern. In Category 1: Staying informed, information use happens time to time, but in an ongoing action, and therefore it is experienced in a continuous mode. This is the lengthiest mode of information use. This act shifts to a dual mode in Category 2, which is a combination of a continuous and situational acts of using information. Here, the experience of information use is mainly situational for every single project. However, it can become a continuous experience when projects need regular updates or maintenance. Then, in Category 3: Problem solving, information use is experienced for clear, specific purposes. This is the most situational mode of this experience. Use of information remains quite situational while web professionals are seeking for quality information in a specific area. However, their use of information becomes a continuous process again when they become aware of the value of contributing their knowledge to the community of practice in an ongoing mode. The above discussion of the categories of description is summarised in Table 4-5.

Table 4-5 Overview of web professionals' experience of effective use of information

Categories	**Meaning**	**Focus**	**Background**	**Margin**	Dimension of Variation 1: **Information**	Dimension of Variation 2: **Information use**	**Feature of Continuity** in Information Use
Cat. 1: Staying informed	Scan and store the information environment	Information-aware	-	-	-	-	-
Sub-cat. A: Keeping current	Scan the information environment to stay informed, updated and skilled	Awareness of the current information trend	Problem solving Knowledge base users	Information giving Client	Emerging movements within the industry	Scanning the information environment	Continuous
Sub-cat. B: Building a knowledge base	Building, maintaining and using a knowledge base	Storing and retrieving information	Problem solving Keeping current	Information giving Client User	Past knowledge of web professional	Storing	Continuous
Cat. 2: Building a successful website	Building a successful website which delivers client's message to the user seamlessly	Delivering a successful website	-	-	-	-	-
Sub-cat. A: Making the client happy	Building a website based on the client's needs	Making the client happy	Web professional's own role	Community of practice Staying informed	Project requirements Client	Developing an understanding of the client's needs	Situational/ Occasional use
Sub-cat. B: Making users satisfied	Building a website usable for group of users	Making users satisfied	Client	Community of practice	User population's characteristics	Developing an understanding of the users' needs	Situational/ Occasional use
Sub-cat. C: Building a seamless website	Building a website that works seamlessly/ with minimum bugs and error	Building a seamless website	Client User Community of practice	Staying informed	Bugs and errors	Effort to build and maintain a seamless website	Situational/ Occasional
Cat. 3: Solving a problem	Solving a problem using the most appropriate information resources	Solving a problematic situation	Staying informed Knowledge base Community of Practice	Building a successful website Information giving	A solution Information resource	The process of problem solving	Situational/ Occasional use
Cat. 4: Participating in a community of practice	Sharing information with a community of practice	Information sharing	Problem solving Building a successful website Staying informed	-	-	-	-

Sub-cat. A: Information giving	Contributing knowledge to a community of practice	Information giving	-	-	Web professional's internal knowledge	Offering personal internal knowledge	Situational/ Continuous
Sub-cat. B: Information take	Using collective intelligence and best practices shared within the community of practice	Information taking	-	-	Reliable knowledge product of the community of practice	Consuming quality knowledge offered by community of practice	Situational

4-5 Conclusion

This chapter presented the findings of the current research. It showed variation in the ways web professionals experience effective use of information. This variation was presented through four categories of description and their sub-categories. Considering the relationships between the four categories and their constituting elements, the pattern of variation was then reported as the outcome space of the phenomenon of effective use of information, which is the ultimate outcome of this phenomenographic study.

Chapter 5: Discussion and Conclusion

5-1 Introduction

This thesis so far has discussed the context of the current study, the research question, as well as the applied research methodology. The findings of the research in the form of an outcome space were also presented in the previous chapter. The current chapter now provides a final discussion of the research findings and their contribution to the body of knowledge. With a structure similar to Chapter 2: Literature review, the present chapter reports the contributions of the study to website design and information literacy. The chapter finishes with several recommendations for further research, followed by some notes on the limitations involved in conducting the study.

5-2 Research Overview

The study presented here was designed with an aim of filling a knowledge gap in the area of workplace information literacy. For the purpose of such investigation, the context of website design and development was chosen. Out of the possible approaches for researching the phenomenon of information literacy, it was decided to explore the variation in experiences of information literacy among web professionals. Phenomenography was selected as the research methodology due to its capability in producing insights into varied experiences of different phenomena in the world, in this case information literacy. To enable participants' understanding, the term "effective use of information" was adopted in this research in place of information literacy. This reflects Bruce's (1997) definition of information literacy.

Adopting a phenomenographic approach, the present study identified four qualitatively different ways in which web professionals experience the phenomenon of information literacy or "effective use of information". The research found that web professionals experience information literacy as:

1) **Staying informed**, in which web professionals experience their effective use of information in keeping current about and preserving the ever-changing information environment surrounding them;

2) **Building a successful website**, in which web professionals experience their effective use of information in building a website that satisfies their clients and users or works seamlessly;
3) **Solving a problem**, in which web professionals experience their effective use of information in solving a problematic situation;
4) **Participating in a community of practice**, in which web professionals experience their effective use of information in giving their knowledge to their community and/or using established knowledge flowing in the community to build upon each other's works in order to make advancements in the field.

5-3 Research Contribution and Implications

The findings of the research presented here contribute to both areas of website design and development, and information literacy. The next two sections align the findings with the existing knowledge in these two areas, to highlight the contribution of the outcome of this study. Furthermore, implications of this study are discussed for each domain.

5-3-1 Contribution to Website Design and Development Research

One of the main areas to which the present study contributes is in its study of web professionals, a more specific domain within the broader area of website design and development. Up to this date, the territory of design, development and evaluation of websites has been extensively explored. Similarly, users engaged in this space have also attracted a significant amount of attention in terms of research. Compared with these two major areas (i.e. website studies and user studies), the third area of web worker studies stands out as having received less research consideration. In this regard, the professional practices and experiences of web professionals have rarely been considered. Given the previous studies' indication of the vital role of web professionals and their influence on website design and development process of websites (Faiola & Matei, 2006; Kim, 2010; Moss, et al., 2006; Tao, 2008), this research partially fills a gap in research about this rarely-explored world of the practice of web professionals.

Prior to this, previous studies had explored web professionals in terms of their required skills and needs (Goles, et al., 2008; Kotamraju, 2002; Sgobbi, 2002), their moral, legal or social responsibilities (Ahmed & Hoven, 2010) or educational aspects of their world (Lennon, 2012; Skov & Stage, 2012; Walker, 2002). The findings of these studies were often used to improve the design and development of the tools used by designers and developers; to

inform them about their responsibilities towards their influential practice or to shed light on their education, for the consideration of stakeholders. Contributing to these existing studies, the current research provides new insights about web professionals' experiences of information literacy in building websites. Information literacy as a concept has never been studied from the viewpoint of web professionals. As a result of this qualitative research, a deep insight into the relationships between web professionals' effective use of information (i.e. information literacy) in building websites as a whole process is revealed.

Prior to this study, "information" and "information use" among designers and developers had been considered by others, but only in a very implicit and scattered fashion (Dorn, Tew, & Guzdial, 2007; Kim, 2010; Lowe & Eklund, 2002; Lynch & Horton, 2008; Rosson, et al., 2005; Williams & Tanner, 2008; Tao, 2008; Walker, 2002). In addition, these researchers did not focus on researching "information". However, this present qualitative research gives voice to web professionals to express their own understanding of information. As a result, in this study, a broader sense of information ranging from clients and users to industry peers, and from established standards to any new emerging trends in the industry were unfolded and a more comprehensive picture of information was presented.

Similarly, the researchers of the previously mentioned studies, while focusing on only one form of information (i.e. textual guidelines) and concentrating on only one specific area of website design (i.e. design), never stated explicitly that they were investigating the information use of website designers. In contrast, the present research by taking a holistic approach to the website design and development process, and giving freedom to web professionals to reflect on any type of information they used, provides a fresh and centralised understanding of information use, and more specifically effective use of information.

Taking advantage of a phenomenographic research approach, variation in experiencing effective use of information among website professionals is revealed in the form of four categories of description and pertinent sub-categories. Several components of this variation were sporadically observed in previous studies, however not necessarily under the name of information-related research. For instance, Goles et al. (2008) and Sgobbi's (2002) findings on the importance of organisational skills in comparison to technical skills for web professionals could be considered as a support to what is observed in this study's Sub-category 2-A: Making the client happy of Category 2: Building a successful website. In this subcategory, effective communication with clients is introduced as a requisite for effective use of information. However, what the two former studies never considered directly is the

informational role of the client for the web professional, which was uncovered in this study as a unique contribution to the field of website design and development. From a similar approach, Sub-category 2-B: Making users satisfied emphasises understanding users as a meaning of effective use of information. Here again the identified informational role of users and what it means to web professionals is recognised as a contribution of the current study. While the satisfaction of users has been recognised before by website evaluation studies (e.g. Atterer, et al., 2006; Mao, et al., 2005), this has not exactly been from the information-related perspective of this current research.

Category 4: Participating in a community of practice has also several components to share with studies conducted before. This category relates closely to the concept of "community of practice", first coined by Lave and Wenger (1991). This close relationship is due to the inclusion of the three crucial characteristics of communities of practice: domain, community and practice. Web professionals in this category have a minimum knowledge of the field of website design and development (the domain), they value information sharing and learning from each other (the community), and all together, they "develop a shared repertoire of resources" (the practice) (Wenger, 2001, p. 2340) in the form of forums specifically or in every other context that allows interaction and conversation. The findings of Sub-category 4-B: Information taking in this category is confirmed with evidence from studies by Kotamraju (Kotamraju, 2002) and Rosson et al. (2005). Both of these studies demonstrated a trend occurring among web professionals in which, for the purpose of learning, they tend to rely on online resources and self-directed learning (such as FAQ and considering similar sites) instead of a formalised education-only approach. Interestingly, in Sub-category 4-B: Information taking of Category 4: Participating in a community of practice the importance of engaging in the community of practice for the purpose of learning is highlighted, which expands the findings of previous studies. However, the contribution of the current research is also identification of a further aspect of information sharing practice flown in the community of practice, called information giving practice (as in Sub-category 4-A: Information giving). This aspect mentions the informational role of deep thinkers and knowledgeable practitioners of the field, that can be translated into the effective use of information.

The participants of the current research also stated that effective use of information might be seen as keeping current about the professional environment surrounding them (Sub-category 1-A: Keeping current, Category 1: Staying informed). This way of experiencing the phenomenon accords with Kotamraju's (2002) findings that also indicated the necessity of

"keeping up", and continual skills maintenance and upgrading for web professionals. However, the contribution of the current study is where a clear link between information and keeping current is manifested and the nature of information used by web professionals for the purpose of keeping current is uncovered.

The findings of Sub-category 1-A: Building a knowledge base within Category 1: Staying informed or Sub-category 4-B: Information taking within Category 4: Participating in a community of practice are also supported by previous studies. In line with the web professionals interviewed in the current study, who point to storing and using the whole or parts of their or others' previous projects, other researchers suggest a similar approach (Dorn & Guzdial, 2006; Dorn, et al., 2007; Rod, et al., 2005). Their research indicates an overall tendency among web professionals for reusing code (named "packed practices" in this research) by sharing it with and borrowing it from each other, as well as using example projects.

Taken together, one of the crucial contributions of the current work is adding further components to and looking from a different approach at the already identified components of web professionals' practices from other studies. In this study these components come together as a result of an understanding of practitioners of the pertinent field. Moreover, adopting an information literacy lens, web professionals' practice is mapped according to an information-related perspective and presented in the form of a new framework.

5-3-2 Implication for Web Professionals' Education and Practice

As a significant outcome, the current work unites research focused on web professionals' effective use of information and findings of non-information-related research. It elucidates extensive but blurred understandings about the nature of information and the effective use of information in the domain of website design and development. This new transparent portrait gives insights into the way web professionals engage with information for building websites in their everyday work practice. As Bruce (1999) mentions, this type of understanding about professionals' learning needs can help website design and development educators and trainers to develop, promote and enable this group of professionals' information literacy. Therefore, this research has the potential to integrate the enhanced resultant understanding into future agendas for web professionals' education and information literacy programs. The findings provide an empirical basis for website design and development educators to design and develop curriculum and learning environments that

respond to current and emerging educational needs in this field in the area of information literacy and within the context of website design and development.

The resultant framework promotes a form of learning which aims to change the learners' way of experiencing a phenomenon such as information literacy (Marton & Booth, 1997). Based on this perspective, educators and trainers in the area of website design and development can utilise the study's pattern of variation to assist their students to become aware of various ways of using information effectively. The structure of awareness uncovered for each of the four categories is of great importance in this process. Taking advantage of knowledge about the focal point of awareness in each category, educators may be enabled to draw the attention of their students to a specific aspect of the phenomenon or compare it with other aspects. By taking this variation into consideration when designing and developing the curriculum and learning environments, educators put in place the most advantageous environment to stimulate learning. This, in turn, assists web professionals to extend their awareness and practice in their professional work.

In addition, this study advances Rosson et al.'s (2005) proposal that shifting the education of web professionals from formalised education to community-based education is a key movement in this area. It also promotes the consideration of community of information users instead of individuals, which educators and practitioners are encouraged to do by Bruce (1997). In this regard, the findings of the present study emphasise the value for web professionals of participating in a community of practice and learning in which information sharing (or "information giving and taking", in the language of the outcome space constituted in this study) serves as a base. This point of emphasis will be of interest for professional associations within the field that want to take a more leading role in the community of practice. Taking advantage of the relevant support of this study, they can enhance their educational practices among practitioners of the field. Along with this, they can act as a channel for promoting the notion of information literacy in the community of practice.

To conclude, in addition to shedding light on the theoretical understanding of web professionals' information and information literacy, the outcome of the present research will also be of interest and significance in the education of web professionals. The findings provide an empirically sound basis for developing pedagogical and curriculum frameworks that enable educators as well as educational policy makers, to provide a context for promoting the notion of information literacy among potential web professional practitioners. This will occur by assisting website design and development students to become aware of

more varied forms of information and the possible ways of effectively using information in their everyday jobs. The findings also support the educational practice of professional associations where they want to take a leading role in educating practitioners of the field.

5-3-3 Contribution to Information Literacy Research

The present study also makes several noteworthy contributions to the growing information research base, particularly information literacy research. On one hand, it enhances the existing understanding of information literacy from a relational approach and, on the other hand, it adds to the evolving concept of workplace information literacy.

For the last two decades, the relational approach has increasingly contributed to the territory of information literacy. The emergence of the relational information literacy approach heightens the need for exploring this phenomenon relationally in different contexts. The present study contributes by offering a new, contextualised, relational model of information literacy that is specific to the web profession. This adds to the previously identified relational views of information literacy. The phenomenon of information literacy, which was first investigated in 1997 by Christine Bruce within an educational context, was then researched in different contexts and from the perspective of different groups of people. To date, information literacy has been investigated within a religious context (Gunton, 2011; Gunton, et al., 2012), and a health context (Yates, et al., 2012). It has been studies from the perspective of UK academics (Webber, Boon & Johnston, 2005; Boon Johnston & Webber, 2007), undergraduate students (Maybee, Bruce, Lupton, & Rebmann, 2013) and secondary school teachers (Williams and Wavell, 2007). However, as in a single phenomenographic study in which information literacy can be conceived in a number of different ways, this phenomenon is unlikely to share similar meanings across different contexts and among people practicing in those contexts. As a result, assuming the results of phenomenographic studies are meant to be applied practically, it is critical to obtain an understanding of this phenomenon in specific contexts. Aligned with the research trend mentioned above, the outcome of this study sheds light on the growing meaning of the relational approach to information literacy within a web context.

As another research contribution, this study addresses the importance of studying the concept of information literacy in different settings, including different workplaces (Lloyd & Williamson, 2008, O'Farrill, 2010) and professions. Information literacy has been researched in different settings so far (see Table 2-3), however, the understanding of the phenomenon in

some contexts such as workplace still needs more articulation. The current study serves as one more link in workplace information literacy research chain. One of the contributions of this research is therefore producing new insights into the contextual understanding of information literacy. This type of meaning of information literacy is very different from existing conventional ones. That is, the kind of research presented here yields knowledge of information literacy that is not usually taught in the classroom. The resultant understanding has implications for practice, especially in the associated web context. This will be discussed more in the implications for practice section.

Regarding the common position of the present study within the two discussed research trends (i.e. relational information literacy and workplace information literacy), this study is especially important as it is one of the few that explores the information literacy concept both relationally, and in a non-educational and non-everyday life context. More specifically, according to Gunton, Bruce and Davis's (in press) review of the evolution of relational model of information literacy, as well as Table 2-3, most of the investigations that have had a relational approach to information literacy in a workplace have occurred in an LIS-related or education-related workplace. In that way, this research has a unique contribution in terms of considering the notion of relationally understood information literacy in a rarely-researched context (i.e. non-LIS, non-educational workplace context). A similar study to this is O'Farrill's (2008, 2010) investigation into the understood information literacy from the perspective of staff of a tele-health organisation. O'Farrill's study (2008, 2010) occurred in a thoroughly different workplace context and did not explicitly acknowledge adopting a relational perspective towards information literacy. However, as a phenomenographic investigation, it is assumed that the researcher was adopting a relational view towards the phenomenon of information literacy. O'Farrill's research, while seeking different meanings of information literacy, produced two outcome spaces that is unusual in phenomenographic studies: one outcome space for portraying the variation in conceptions of "effectiveness" and the other one for illustrating different conceptions of "effective use of information". However, there are some similarities in terms of uncovered conceptions between the O'Farrill's study and the current research. For instance, both studies value meeting clients/users' needs as one meaning of information literacy. While O'Farrill (2010) phrased it as "giving appropriate advice and information to the organisation's clients", the present study frames it as a "satisfied user" or "happy client" as two sub-categories of Category 2: Building a successful website. As another example, the two studies suggest being widely aware of the

surrounding information environment as one meaning of information literacy. This conception was presented in two categories of description in O'Farrill's study (2010): "awareness of information and knowledge sources" and "awareness of procedures, changes and events that affect the service". However, in the current research, it is introduced as a sub-meaning (Sub-category 1-A: Keeping current) of the general meaning of staying informed (Category 1).

As was mentioned above, O'Farrill's study resulted in uncovered variation of two different phenomena: effectiveness and effective use of information. While effectiveness was not the phenomenon investigated in the current study, it is interestingly observable that some of the revealed conceptions of effectiveness in O'Farrilll's study are discovered to be meanings of information literacy in the current study. For instance, "appropriate communication", "appropriate outcomes" and "managing performance" as different meanings of effectiveness in O'Farrill's research (2010) are translated to one of the meanings of information literacy in the current study: Building a successful website. In Category 2 of the present study (i.e. Building a successful website) and its associated sub-categories, successful practice of web professionals in building websites is interpreted as effective use of information. Another explicit example of overlap between the conceptions of effectiveness in O'Farrill's study (2010) and effective use of information in the current study is developing a knowledge and skills base. While O'Farrill's research (2010) saw this as a conception of effectiveness, the present study recognises it as one sub-meaning of effective information use in Sub-category 1-B: Building a knowledge base.

Regarding these types of observation, one may argue that relational understanding of information literacy shares some conceptions across different workplaces. However, more research is still required to affirm this. Furthermore, yet explicit differences in findings of the two studies compared here restate the fact that relational information literacy may have its own meaning in every single workplace. For instance, "using information systems" is a meaning uniquely related to the context of O'Farrill's study (2010) (i.e. tele-health organisation) which does not share a place in web professionals' understanding of information literacy. Therefore, for uncovering such specific meanings of information literacy in different contexts, there will be no other option except for investigating this phenomenon in separate contexts.

Theses types of studies could be considered as pioneers in exploring information literacy relationally in new contexts. As a result, the current study is a valuable contribution,

which helps illuminate the emerging portrait of relational information literacy in a unique workplace.

It should be acknowledged here that the context in which the current study occurred is not a physical workplace, but a professional space. Many of the participants of this study were not employed by an organisation and therefore, did not work in a physical workplace. However, they were interviewed as an important part of the community of practice of web professionals. Therefore, the term "professional information literacy" seems to be a more descriptive term to be used for this type of workplace information literacy studies. As a result, it is recommend that this term is used along with workplace information literacy, where appropriate. In that sense, the term "professional information literacy" may be used to cover the investigation of the concept of information literacy in broader workplace contexts and among cohorts who do not necessarily work together physically.

5-3-4 Implications for Information Literacy Education and Practice

Similar to website design and development education, the findings of the current study will be beneficial to the education of information professionals. Library and information science (LIS) educators may draw upon the findings of this information literacy research for the education and training of LIS students. This is especially important as many LIS education programs value an understanding of both the emerging theoretical basis for information literacy and ways in which the information literacy needs of different individuals and communities can be supported in practice. In this regard, the outcome of this study could be transformed to create a highly relevant framework of information literacy that could be used as a learning design tool by educational practitioners. The result of this study therefore is relevant to current and future LIS curricula (Sayyad-Abdi, Partridge, & Bruce, 2013).

Based upon the contextualised findings of the current study, it may be also possible to extend the concept of information literacy beyond library and classroom walls, into new professional development environments. In the case of the present study, this implies enabling website design and development industry practitioners to develop awareness of information literacy fundamentals. This type of endeavour is in full agreement with the recommendations of Hepworth and Smith (2008), and O'Sullivan (2002).

Beyond the educational setting, the results of this research will be of interest to library and information service professionals. It is especially relevant to those information professionals who work closely with website design and development practitioners.

Information professionals practising in workplace contexts play important roles in building information and learning spaces, organizing information resources and enabling their clients to access these resources (Bruce, Hughes, & Somerville, 2012). Based on the variations in web professionals' experiences of information literacy and nature of information, information professionals who support this cohort of practitioners could modify their services to meet web professionals' information needs more effectively.

A second group of information professionals who would benefit from the outcome of this research would be those who work as website design and development team members (e.g. as an information architect). Being aware of the varied ways in which practitioners of the field (i.e. web workers) experience information literacy enables these information professionals to act more effectively in their teams and build more powerful relationships with their web professional team members, whilst speaking the same information language. This awareness will be of value to the professional development of information service practitioners beyond the library domain. An implication then would be expanding the library and information science scope to strengthen interdisciplinary collaboration.

In summary, the present research enhances the emerging theoretical understanding of information literacy. This occurs through generating another relational model of this phenomenon in a new context. This contributes to the formation of a more robust image of relational information literacy. The study also has implications for educational matters of information literacy in the LIS field. The findings also will be of interest to information service practitioners who seek involvement beyond the LIS territory.

5-4 Limitations of the Study

Similar to any research, the present study has some limitations. Firstly, like other qualitative studies, the present phenomenographic research was highly dependent on the research and interpretive skills of the researcher. The researcher acknowledges her initial limited experience in conducting phenomenographic interviews and analysing data. This, for instance, included lack of full competence in following up the underlying meaning of the experiences expressed by the research participants.

The researcher also acknowledges that being a second language speaker of English at times might have affected communication with the participants. However, she gradually developed confidence and expertise in these areas through the research process, to the extent that she is now able to present this finely analysed and coherently argued research report. In

some aspects her research benefited by bringing a fresh approach to phenomenography, and her cultural and linguistic background enabled her to develop a respectful and supportive rapport with culturally diverse participants.

A third limitation of this study is related to the potential communicability of the outcome with other paradigms. As was mentioned earlier, phenomenography assumes that 15 to 30 interviews is enough to produce the maximum variation in ways of experiencing a phenomenon. Therefore, the relatively small number of web professionals who were interviewed for the purpose of data collection in this study does not allow generalisability to different contexts. The qualitative nature of the findings differs from the nature of much research within both the library and information science and website design and development fields that often adopts a quantitative approach. However, this research presents fresh in-depth insights that extend and illuminate quantitative findings about website design and development and associated professionals. The applicability of the research findings will be enabled through publications stemming from this doctoral research.

5-5 Future Directions

This study provides a strong foundation for further research, that is outlined below.

A novel area of study: The current research opened up a context for investigating the nature of information understood by web professionals, the relationship between information and web professionals. Therefore, the study presented here could be considered as a prologue to the previously uncovered area of web professionals' engagement with information. More research could assist in stronger establishing this area of study. Such a foundation, in return, will provide researchers with abundant room for further studies in exploring the mentioned relationship from different aspects. An example of this could be investigating how web professionals' information use may influence their practice.

Studying the divided research population: In the current study, website design was considered as a whole process. Therefore, participants were selected from different areas of the building process of a website, ranging from design to actual development. As a result, it was not possible to gain a view of the differences between experiences of website designers as distinct from website developers. Therefore, it would be interesting to undertake separate research for studying experiences of people in each of these two areas. This would lead to a more specific relational model of experiences in relation to more specific areas of expertise. A further area of investigation in this regard then would be a comparison between the

resultant relational models from those studies and the one stemming from the current study. This would disclose the relationships between the resulted relational models and possibly add to the level of detail of the current relational model.

Continued data collection and analysis: According to phenomenographic research, the outcome space constituted from analysing 23 interviews demonstrates the maximum variation in the experiences of research population about the phenomenon under investigation. However, it is recommended more interviews be conducted with web professionals in order to confirm that the maximum variation has been obtained. Similar to the purpose of studying the variation among the divided research population (i.e. website designers and web developers) mentioned above, taking the approach of further data collection and analysis would also enrich the categories of description currently at hand. Adopting such an approach may yield more critical features of the phenomenon under investigation that are vital to the understanding of the currently presented variation. The data for further analysis could be collected from different geographical contexts, cultures and time periods.

Using a contemporary view of variation theory: The current research used a traditional form of phenomenography to describe the variation in experiences of the phenomenon at issue. The findings of this study are of importance and value to research, education and practice in both fields of information literacy, and website design and development. However, as the ultimate aim of conducting a phenomenographic study is the application of findings in teaching (Edwards, 2006), more insights on the uncovered variation could enrich the teaching practice of educational practitioners. This could be achieved through applying a contemporary variation theory in research that restudies the phenomenon of information literacy of web professionals. Adopting such practice would strengthen the variation theory in explaining "why" of the observed variation. This type of understanding is achieved through identifying the differences between what educators plan to be learnt by students and what students actually learn (Marton, in press). Through such understanding, educators would be enabled to design their teaching practices in a way that students can get the most out of the provided learning environment.

More research efforts into the concept of workplace (professional/occupational) information literacy: The current understanding about workplace (professional/occupational) information literacy is still immature. In light of the emphasis of Lloyd and Williamson (2008) on researching information literacy in workplaces, future

research concentrating on the investigation of the information literacy concept within more workplaces is recommended. This is vital in light of the significantly different nature of each workplace setting, which obviously may have a strong influence on the nature of information in those workplaces and the unique ways in which people may engage with information. This type of study would be of interest to not only information literacy researchers, but also practitioners, experts and authorities from different disciplines (i.e. relevant workplaces and professions). It would provide information literacy advocates with opportunities for interdisciplinary collaboration, which is of benefit to both the field of information literacy and the people engaged in those disciplines.

Endeavour to nurture the relational approach to information literacy: Although research into the phenomenon of information literacy launched through a relational approach in 1990s, the understanding of information literacy seen from such an approach is still unfolding. This is mainly due to the abstract nature of the phenomenon and the broad range of meaning it conveys in different contexts. Therefore, further phenomenographic research which explores information literacy is required. Through this research trend, a more robust picture of the relational approach to the information literacy concept is anticipated. As outputs of phenomenographic research mainly have application in teaching, the insights gained would advance information literacy education.

With respect to the two research trends just mentioned, by scrutinising the phenomenon of information literacy in particular workplaces and professions and at the same time, from a relational perspective, a specialised understanding of workplace information literacy from the relational approach could be nurtured. This area has the potential to become an established research trend in the broader territory of information literacy. The outcome of such research would be specifically of advantage to educators in the associated context. They may use the specialised findings of variation in experiencing effective use of information among workers of the field to prepare students for their future work environment.

Framing a consideration for phenomenographic analysis: The present research took advantage of a phenomenographic approach. During data analysis an interesting pattern was observed in the movement of the existing elements within the structure of awareness of the four categories. In Chapter 3: Methodology, the structure of awareness including the focus of awareness, background and margin, was discussed. It was mentioned that there may exist different elements in each of these zones, in different categories of description of the outcome space. In the outcome space of the current phenomenographic research, however, it was

observed that most of the elements that appear as focal points of the categories exist in the background or margin of the other three categories. This pattern was also apparent in the doctoral research of Harding (2011), where the background elements of each of the four categories were the focal points of the other three categories.

Although the pattern observed in Harding's (2011) research and the current study might be exceptions in existing phenomenographic outcome spaces, this raises a methodological question for exploring the possibility of framing this observation into an established consideration in the analysis of phenomenographic research data. In that sense, when forming a category, other categories may be inspected to check if they indicate potential concepts for inclusion. This observation could be of interest to completed phenomenographic research. Additionally, efforts could be made to take this observation into consideration in future phenomenographic research, in which additional analysis is conducted for this purpose. However, it should be acknowledged here that this is only a "consideration" to be taken at the time of data analysis and, therefore, it shouldn't be treated as a "definite rule" that imposes constraints on the constitution of the outcome space.

Communicating the outcome of the study: This research provided a theoretical understanding of experiences of information literacy among web professionals. What is further needed in order to transmit the theory to practice is communicating the outcome of the study to different settings. In this regard, the educators and practitioners of the web design industry along with library and information service professionals should be made aware of the outcome of the current research. This would be done through publishing papers targeting the mentioned audiences, as well as presenting the outcome to relevant communities through seminars, conferences and forums.

5-6 Conclusion

The research presented in this thesis gives new insights into the under-researched domain of website professionals' information literacy. Taking advantage of a phenomenographic research approach, this study reveals a pattern of variation in the ways in which this group of professionals experience information literacy. This variation, along with the relationships among its constituting components, is presented in a relational model as the ultimate outcome of the present study. This relational model of information literacy contributes to the conceptualisation and promotion of this phenomenon in the website design and development industry. As a result, the findings of the current research will be of interest

and use to researchers, practitioners and educators in the field of website design and development. Additionally, the outcome will be valuable for library and information science researchers and educators as well as information professionals who support the research and development of the ever-changing industry of website design and development.

Appendix 1 Ethics

Ethical approval was obtained from the Human Research Ethics Committee of Queensland University of Technology (Approved Number: *1100000261).* In conformity with this approval, each participant was provided with an Information Sheet and a Consent Form prior to the interview.

This research followed a standard procedure in order to ensure the rights of all participants were protected during the research process. Once the participants were well informed of the research and agreed to take part in the interview, they signed the Consent Form.

Appendix 2 Pilot Study

The current study started with the aim of investigating the phenomenon of information literacy among web designers, and specifically specialists in design of the content and structure of websites (e.g. information architects). Prior to implementing the main study, a pilot study was designed and conducted in order to confirm the presentation of the phenomenon, as well as to check if the right research population was being approached. The first pilot interview was designed in a way that investigated the relationship between Website Design (in terms of design of the content and structure of websites) and Information Literacy of Web Designers. That is, at first, the phenomenon to be explored was presented as a relationship between two phenomena. Moreover, the research population only included web designers, and not all people involved in the process of building a website.

As a study exploring the relationship between two phenomena, the interview questions were developed mainly based on questions used in Lupton's (2008) study, which investigated the relationship between the two phenomena of information literacy and learning. The questions of the first pilot interview with a senior information architect were as follows:

- Tell me about a website that you have designed and its content and structure.
- Describe how you design the content and structure of a website.
  - ✓ Were you happy with the design?
  - ✓ What helped you designing the content and structure?
  - ✓ For you, what is content and structure design?
  - ✓ How do you understand content and structure of a website?

- What kinds of information do designers use?
- How do they use information effectively for designing a website?
- What kinds of information do you draw on to design?
- Describe a time you used information effectively for designing a website.
- Reflecting on your experiences of content and structure design and effective use of information, how does using information effectively affect your approach to content and structure design?
- For you, what is the relationship between using information and website content and structure design?
- Is there anything else you would like to say about effective use of information and website content and structure design?

The first pilot interview occurred at a very early stage of this study. As the research proceeded, the focus on "Web Design" as a single phenomenon weakened. This was as a result of reviewing literature and gaining a clearer view of web professionals' world and the territory of information literacy. Therefore, the research questions were refined to explore only the phenomenon of "Information Literacy" within a website design and development context. In line with this, as one of the first studies into the web professional's world, it was decided to broaden the focus of this research to not only cover content and structure design but also the whole design and development process. In this regard, the first pilot interview was substantially different to the rest of the interviews. Therefore, it was numbered as "Interview 0" and the data obtained from it was not entered in the data pool.

Based on learning from Interview 0, the second interview (Interview 1 hereafter) was then designed and conducted with an information architect. The questions were as follows:

Question 1. Describe how you design a website.
Question 2. Describe how you understand a website.
Question 3. Describe a time that you used information effectively for designing a website.
Question 4. What kind of information do you use to design a website?
Question 5. How do you use information effectively to design a website?

Similar to Interview 0, Interview 1 also shed light on areas that needed to be refined. This is highlighted separately below for each question.

Question 1. Describe how you design a website.

Asking this question in Interview 1, the researcher observed that the interviewee was mainly talking about her current position in the team. Therefore, to ensure revealing more variation in her experience, the researcher decided to incorporate an additional part to the question that encouraged the interviewees to reflect upon their career-life experience of website design and development. Therefore, the question was changed to:

(Refined) Question 1. Describe how you design/develop a website upon your whole job experience in the website design and development area.

The next three pilot interviews confirmed this question as an appropriate question to be asked in the main interviews. The first question served as an ice breaker for most of the interviewees, as it was asking them about a tangible task with which they were all familiar.

Question 2. Describe how you understand a website.

The second question was asked aiming to follow the mission of the previous question in situating the phenomenon in a concrete form. However, from the transcription of Interview 1, the researcher realised that dragging the focus of interviewees to their understanding of the task of "website design/development" was more important than their reflection about "websites". Therefore, the question changed to:

(Refined) Question 2. Describe how you understand website design.

Question 3. Describe a time that you used information effectively for designing a website.

This was the first time in the interview that the word "information" was posed. The word information appeared to be a bit vague for the interviewee. In order to prevent this ambiguity for the rest of the interviewees, the researcher decided to postpone asking this question until the participant has responded to Question 4 (which was about different kinds of information). In this way, at the time of asking the current question, the interviewee had already reflected on his/her understanding of information. Question 3 has also a closer relationship with Question 5. Therefore, the researcher thought it was better asking them sequentially.

Question 4. What kind of information do you use to design a website?

This question was supposed to lead the interviewees to talk about the information sources they might use during the design and development process. However, the researcher noted that the first interviewee only talked about "content" when she heard the word "information". Although this might have been the case only for that interviewee, posing the question in another way in the rest of the pilot interviews proved that rephrasing that question could help in eliciting different material from different parts of participants' awareness. Therefore, in order to have the interviewees' reflections and ideas about all sorts of information in the process of building a website, the question was changed to:

(Refined) Question 4. What informs you during the design process?

The researcher also thought of more simple forms of the rephrased question above, which were prepared to be used as alternatives where needed:

- **What are the factors that you take advantage of to design a website?**
- **What is information for you?**

As it was mentioned above, in Interview 2 onwards, this question was asked as Question 3.

Question 5. How do you use information effectively to design a website?

Question 5 stayed unchanged during the series of interviews. However, as it was a critical question in generating data about the exact experience of participants from the phenomenon, a supplementary question (i.e. Question 6) was designed to follow this question from Interview 2 onwards. This was done with the aim of helping the interviewees to reflect more on their experiences.

(NEW) Question 6. How do you know when you have used information effectively to design a website?

As was observed, the most changes in the interview questions occurred after Interview 0 and Interview 1. The next three pilot interviews with a web designer, a principle information architect and a web developer confirmed the appropriateness of the questions.

Appendix 3. Research Participants Distribution

As was mentioned when discussing the research population in section 3-5-1, one third of the research participants in this study were selected from each of the three major areas of website design, website development and combination of the two. Table A-1 shows the distribution of types of participants. Participants' sex and position are also shown in this table.

Table A-1 Research participants distribution

Interview No	Sex	Major area of Practice	Position
0	Female	Designer and Developer	Freelance Website Designer and Developer
1	Female	Designer	Web Content Editor
2	Male	Designer	Graphic Designer
3	Male	Designer	Information Architect
4	Male	Designer and Developer	Freelance Website Designer and Developer
5	Male	Developer	Back-end Developer
6	Male	Designer and Developer	Website Project leader
7	Female	Designer and Developer	Freelance Website Designer and Developer
8	Female	Designer	Graphic Designer
9	Female	Developer	Programmer
10	Female	Designer and Developer	Freelance Website Designer and Developer
11	Male	Developer	Programmer
12	Male	Designer and Developer	Freelance Website Designer and Developer
13	Male	Developer	SEO Specialist
14	Female	Designer	Freelance Website Designer and Developer
15	Male	Designer	User Experience Designer
16	Female	Developer	Programmer
17	Male	Developer	Web Developer
18	Female	Designer and Developer	Front-end Developer
19	Female	Designer	User Experience Designer
20	Male	Designer and Developer	Website Development and Marketing Consultant
21	Male	Developer	Developer
22	Female	Designer	System Analyst
23	Female	Designer	Information Management Specialist
24	Male	Developer	Programmer

Appendix 4. Social Media Advertisement

The present research project used a snowballing sampling method for recruiting the participants. In this method, existing participants introduce further participants from among their acquiantances. Through this method, the researcher is able to quickly and simply find participants who met the criteria for taking part in the research, because people often know those who are better at their job than them. For the present research, different departure points were used in finding participants. One important departure point was social media such as Twitter and Facebook, or colleagues' and friends' blogs. In these cases, an advertisement was posted. Two examples of these advertisements, on Twitter and Facebook respectively, were:

"I'm looking for #website #designers/#developers to participate in a study of their information use. Tweet me back if interested." (The advertisement was short due to the nature of Twitter.)

"Please share

Website designers/developers study

You are invited to participate in a study exploring website desingers/developers' information literacy, conducted by Ellie Abdi at the Queensland University of Technology (QUT), Brisbane, Australia.

The study involves a one-hour interview (via Skype or face-to-face) about how website designers/developers use information effectively to design/develop a website.

If you are practicing in any part of the website design/development process, and would like more information about participating, contact me at e.sayyadabdi@qut.edu.au

Please be informed that the research process has been reivewed by the University Human Research Ethics Committee at QUT and confirmed as a low risk research."

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